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Electronic Cigarettes: How to improve performance in the Portuguese market according to Portuguese consumers' perception

Consumers' analysis of attitudes and acceptance as well as preferred features/characteristics.

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Abstract

Title: Electronic cigarettes: How to improve performance in the Portuguese market according to Portuguese consumers' perception

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The aim of this dissertation study is to analyze the opportunities of improving the Portuguese electronic cigarettes' market based on an investigation of electronic cigarette smokers and the reasons which led them to start using these products. An additional investigation was carried out among non-smokers and the traditional cigarette smoker population to understand their perception of electronic cigarettes and to cover all opinions related with the use of this product and consequently of this market.

The outcomes of this dissertation study reveal that ex-traditional tobacco smokers shift from traditional tobacco to electronic cigarettes in order to pursuit a healthier lifestyle. Also, this study exposes features that influence the overall satisfaction of electronic cigarette users and the profile of them, and even considers Dual-Users.

Finally, other tests were made regarding smokers, non-smokers, ex-smokers and users of electronic cigarette that went back to traditional tobacco smoking. The purpose was to gather the most suitable sample and different perceptions.

Keywords: Aerosol, Electronic Cigarette, Heated Not Burn, Liquid, Tobacco, Vaping

Resumo

Título: Cigarros Eletrónicos: Como melhorar o mercado português através da perceção de consumidores portugueses

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Este estudo foi feito com o objectivo de analisar as oportunidades de melhoria do mercado português de cigarros electrónicos através da investigação dos hábitos de consumo dos utilizadores de cigarros electrónicos e dos motivos para os usar. Além do mais, foi feita outra investigação considerando não fumadores e fumadores de tabaco tradicional com o objectivo de recolher todas as percepções destes produtos (cigarros eletcrónicos) como do seu mercado.

Os resultados deste estudo revelam que os ex-fumadores de tabaco tradicional mudam para o consumo de cigarros electrónicos com o objectivo de seguir um estilo de vida saudável. Além do mais, este estudo expõe características que influenciam a satisfação global dos utilizadores bem como o sue perfil e considerando também os Dual-Users.
Por último, outros testes foram feitos considerando fumadores, não-fumadores, ex-fumadores e fumadores de tabaco tradicional que já foram utilizadores de cigarros electrónicos. O objectivo desta análise a tantos e diferentes perfis é de obter uma amostra representativa e uma maior variedade de percepções sobre os cigarros electrónicos.

Palavras Chave: Aerosol, Aquecidos Não Queimados, Cigarros Eléctronicos, Liquidos, Tabaco, Vaping

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Chapter 1 - Introduction

1.1 - Contextual Trends

Pursuit of a healthier lifestyle

Health consciousness was defined by the individual choice to act in order to what is beneficial to their health. Consumers who are health conscious are frequently in the pursuit of methods to improve their well-being and driven to seek a better quality of life, avoiding conducts which could be potentially harmful to their health and well-being. One's well-being acting as a significant factor to predict a healthy-lifestyle (Ansari & Talan, 2017).

Education plays a fundamental role in the promotion of healthy habits and in the prevention of illnesses. Recently, significant consideration has been given to scrutinizing the fundamentals of health. Personal behaviours, like smoking, may increase or decrease the threat of ill health, those behaviours being summarized as "healthy lifestyles".

""Healthy environments" consists of the environmental, economic and social conditions that can both impact directly on health, as well as support healthy lifestyles, e.g. by making it more or less easy for an individual to smoke or adopt a healthy diet." (Nutebeam, 2000).

Consumer's behaviour

The behaviour of an individual in the process of selecting and purchasing products to fulfil his/her needs and desires is denominated as consumer behaviour (Solomon, Bamossy, Askegaard, & Hogg, 2006).

Consumers are constantly choosing among a wide variety of products and services. In recent years, consumer and purchasing behaviour has become more complex, becoming an important issue for companies, with a huge number of consumers constantly looking for different and more products and services. Nowadays companies invest in learning about the essentials of consumer behaviour (Singh, 2014) as this knowledge plays a significant role when it comes to having a better understanding of the consumer through different products, services, brands and companies.

This dissertation study is focused on electronic cigarettes and its purpose is to improve the Portuguese electronic cigarettes' market performance based on consumers and non-consumers perceptions of the different types of electronic cigarettes.

1.2 - Problem Statement and Research Questions

The problem that this research aims to solve is the following:

How to improve electronic cigarettes market, for instance:

- How to attract traditional tobacco consumers and persuade them to switch to electronic cigarettes?
- Which consumer segments are stronger, and which require a new strategy, based on socio-demographic characteristics?

To address this problem statement in the most suitable way the research questions made were the following:

Research Question 1

- *Do consumers of traditional tobacco cigarettes shift from traditional tobacco cigarettes to electronic cigarettes in order to pursue a healthier lifestyle?*

This question is made in order to understand the driver that leads traditional tobacco cigarette smokers to switch to electronic cigarettes. The answer to this question lies in understanding if consumers of electronic cigarettes would like to combine their perception of a healthier lifestyle with their addiction to nicotine, by switching to a smoking method that is considered by the majority of the population as having less harmful consequences than traditional tobacco. If the results of this question confirm that consumers switch their smoking method with the aim of pursuing a healthier lifestyle, then this result may influence existing traditional tobacco consumers to switch their smoking method and hence lead to an increase in the number of electronic cigarette customers.

Research Question 2

- *What are the features that most influence the overall satisfaction of consumers of electronic cigarettes? (the ones with a higher effect on satisfaction levels)*

This question is included in order to understand which features/characteristics of electronic cigarettes bring more or less satisfaction, so that brands and producers understand in which one they need to focus to improve and which ones they need to expose with more impact on non-consumers in order to persuade them to change to the electronic cigarette world. Once again, this question could improve market performance, as its answer could at least represent an opportunity for brands or manufacturers to understand which features of their devices are more pleasing and which are less pleasing, and therefore improve them.

Research Question 3

- *What is the profile of electronic cigarette consumers in Portugal?*

The final question in this dissertation is made with the purpose of determining the profile of electronic cigarette consumers in Portugal. This information could also contribute to improvements in the electronic cigarette market, with brands and manufacturers benefitting from a better understanding of who are their consumers[1] and then work on new ways of addressing and fulfilling their needs.

1.3 - Research Methods

All primary and secondary data collected was obtained from scientific literature, electronic cigarette websites, in-depth interviews and an online survey. Thus, descriptive and inferential statistics were made with the assistance of SPSS to analyse the data which incorporated the hypotheses formulated and the possible analyses formulated from the previous information combined from literature review and the information collected by the qualitative and quantitative research.

[1] Which segments are stronger and which segments may require a new strategy

1.4 - Managerial and Academic Relevance

This study aims to bring a new perception of this innovative product in the Portuguese market. It also draws a distinction between electronic cigarettes containing liquid and the electronic device called IQOS, that arrived at Portugal in 2015, which contains actual tobacco leafs. This device had its pilot test in Japan and in Italy and is now available in more than 20 countries, like in Portugal (Kress, 2017) (Rossel, 2018) (ObservadorLab, 2018).
This dissertation study could serve as an example to enrich further studies in other countries. Lastly, this study could contribute for marketers to have a better understanding of Portuguese consumers' preferences and perceptions and also non-consumers perceptions of this product. Additionally, marketers will recognize which characteristics/features better fulfil the needs of Portuguese users of the different types of electronic cigarettes.

1.5 - Dissertation Structure

This dissertation study consists of six chapters, namely: *Introduction* to present the topic, and insights, *Literature Review* where the insights and the hypothesis for the research questions were formulated, *Research Methodology* presenting the qualitative and quantitative research aligned with the literature review insights. The fourth chapter focuses on *Data Analyses* where the data collected from the qualitative research will be tested and analysed and the respective results presented, the fifth and the sixth chapters will be the *Conclusions and Limitations and Further Research* where data will be discussed, and various suggestions will be made concerning future research and limitations of this dissertation study.

Chapter 2 - Literature Review

2.1 - Traditional Cigarettes

According to the World Health Organization, in 2016 tobacco was one of the main causes of death (Lusa, 2017). Traditional cigarette smoking is estimated to kill six million people annually around the globe. Current debates are underway concerning the possibility of electronic cigarettes being a means of reducing some of the harmful effects of smoking, as the nicotine found in these is supplied in a less toxic manner. (Braillons, 2016) (Farrimond, 2017) (Anne Y. Oh & Ashutosh Kacker, 2014). Tobacco use remains the single most avoidable cause of disease, disability, and death in the United States of America, affecting more than nine million people. In the case of Portugal and according to the institute of Health Metrics and Evaluation, tobacco consumption was responsible for the death of 11,000 people in 2010 (DGS, 2014).

Along with other substances and products, tobacco remains one of the most addictive products, which means that tobacco products contain substances, like nicotine, that create dependency on the consumer. Nicotine, the toxic oily liquid which is obtained from tobacco plants, is highly correlated with the feeling of pleasure and relaxation. The addiction can be so strong that when users try to give up smoking, they experience withdrawal symptoms originating from the lack of nicotine such as anxiety, irritability, increased appetite, to name but a few (Benowitz, 2008). Smokers say that traditional cigarettes act as stress and appetite suppressors, nicotine being highly correlated to weigh control or weight loss. This is due to the fact that nicotine may lower a person's insulin level, which in turn lowers appetite and sugar cravings (Kluger, 1996).

Throughout times, smoking has been seen as a socialization vehicle with users starting to smoke as a means of socialization, a habit which then leads to nicotine dependency. More than that, we need to have in mind that traditional cigarette smoking consists of a continuous combustion process, meaning that when one smokes not only is nicotine released, but also other harmful chemicals. To add to this and as mentioned in the beginning, traditional tobacco smoking remains the single most avoidable cause of death in the world due to the numerous forms of diseases that this product can provoke in the human being.

2.2 - Electronic Cigarettes

The first electronic cigarette was developed in China in 2003, being introduced in the USA market in 2007. Electronic cigarette awareness among traditional tobacco cigarette smokers had a real boost among the latter, and by 2013 half of these had tried one. This boost was driven by advertising campaigns of these products. As tobacco brands were banned from advertising their products on TV or radio since 1970, when electronic cigarettes were launched in the USA with no FDA restriction, they took this opportunity and aggressively used all the available marketing channels (Hyman & Brown, 2017).

On a different approach, when electronic cigarettes arrived in Europe they were first seen with scepticism, despite the recognition that these devices were aimed at mitigating the major threats of smoking traditional tobacco cigarettes. Nonetheless, health risk concerns remain to be answered (Henkler & Luch, 2014). This said, according to a pan-European survey undertaken in 2012, 12% of the population aged above fifteen have tried electronic cigarettes or other electronic nicotine delivery system (Stoklosa, Drope, & Chaloupka, 2016).

2.2.1 - Definition

Electronic cigarette (known as E-cigarette, or E-cig or Electronic Nicotine Delivery System) is a battery-operated device created with the purpose of delivering nicotine by inhaling the aerosol created. In this dissertation, electronic cigarettes were divided in two types, Electronic Liquid Cigarettes and Electronic Heated-Tobacco Cigarettes. The first one contains an atomizer that converts the contents of a nicotine cartridge, when heated, into a solution rather than smoke, called vapour (aerosol[2]) which will be inhaled by the user. Instead of burning tobacco and creating smoke, like traditional tobacco cigarettes, electronic cigarettes heat the liquid and produce an aerosol, which at the same time delivers nicotine. The liquid is used to fill and refill the electronic cigarette, being sold as replaceable cartridges which may either have a similar taste to tobacco or contain other flavours. This type of electronic cigarettes can also be sold as one-use disposable E-cigarettes. These electronic cigarettes may differ in appearance according to the respective brand, type and model, and they can also resemble cigars, pens, tanks or common items (Mastrota, 2017) (Hyman & Brown, 2017).

[2] "An aerosol is aerosol is a suspension of fine particles of liquid, solid, or both in gas: both the particulate and gas phases are mixtures of chemical substances in e-cigarette aerosols that is frequently but inaccurately referred to as vapour (a vapour is a substance in the gas phase)." (Mastrota, 2017)

As for the second type, instead of heating the synthetic liquid to create an aerosol, the tobacco leafs are heated instead of burnt. Once again, an important aspect is that smoke only appears when expelled by the user. This second type, the Electronic Heated-Tobacco Cigarette, is not new but it has been tested recently in several countries like Japan or Italy. This device instead of burning the tobacco, heats the tobacco leafs at a lower temperature which still allows the smoker to experience, through an aerosol, the true taste of tobacco without the disadvantages of a traditional tobacco cigarette like the ashes, the smoke and obviously the burning of the tobacco plant (Morris, 2018) (Caputi, Leas, Dredze, Cohen, & Ayers, 2017) (Glantz, 2018).

2.2.2 - Acceptance

Electronic cigarettes became popular due to the fact that they only use nicotine from tobacco plants and, instead of generating smoke, they generate an aerosol that is only released during exhalation (Mastrota, 2017). Additionally, the fact that these devices mimic so well the act of smoking also greatly contributed to the smoking community's acceptance.

In the case of the adult users, research on electronic cigarettes showed that many of them give significance to the "group experience" provided by electronic cigarettes as well social opportunities to vape. On the other hand, electronic cigarette use is a way of young people develop a "cool" image. It is seen like a socialization tool (Farrimond, 2017) (Schripp, Markewitz, Uhde, & Salthammer, 2013) with studies suggesting that the boom observed among adult electronic cigarette users will be replicated in the young adolescent population. (Mastrota, 2017) (Hyman & Brown, 2017).

Several regimes have already introduced restrictions in the flavour offer in an attempt to make them less attractive and to make the perception of electronic cigarettes more like a traditional tobacco cigarette instead of a NRT. At the same time studies have been showing that the possibility to customise flavours, liquids and nicotine amount is the reason which greatly contributed to the growing popularity of E-cigarettes among the population. (Farrimond, 2017) Vaping brought the common idea that it was healthier than traditional tobacco smoking, bringing along pleasure, a sense of feeling healthier, a feeling of "life improvement", there being no study available capable of measuring this impact. In order to understand the rapid acceptance of electronic cigarettes, we need to have in mind that electronic cigarettes were developed to mitigate some of the health hazards triggered by smoking traditional tobacco, such as the constant smoke release, whereas in the case of electronic cigarettes an aerosol is released only during exhalation as opposed to continuous smoke release. The fact that E-

cigarettes do not have combustion contributes to users' perceiving this as a better and safer alternative to traditional tobacco cigarettes. Along with this, users see their healthier benefits like reducing stress, making these devices more exciting and having more reasons to use them. In fact, electronic cigarettes are strongly marketed as lifestyle-choice consumables (Mastrota, 2017) (Farrimond, 2017).

Supporters of electronic cigarettes stimulate the development of the product as a reliable alternative method for giving up traditional tobacco cigarette use because these devices are another nicotine delivery system. Recent studies show that electronic cigarettes are a more natural method to cut down tobacco cigarette consumption because an E-cigarette mimics the act of smoking, like having a break to smoke a cigarette, an object to puff and of course the production of smoke (Anne Y. Oh & Ashutosh Kacker, 2014). Supporters also believe that E-cigarettes have the potential to diminish the thousands of carcinogens found in the smoke released by tobacco smoking, reduce non-smokers' exposure to second handed smoke, while time satisfying smokers' nicotine desire (Dawkins, Kimber, Doig, Feyerabend, & Corcoran, 2016).

Scientific evidence states that electronic cigarette consumption is growing, however not changing the health position to a large extent. On a focus group in the USA about electronic cigarettes, a quote was highlighted as a summary of the experience of smoking an E-cigarette as "*It's not smoke, it's not tar. It's not 4000 chemicals. Case closed*". In Europe, in the UK for example, a major European reference in tobacco control policy due to their high acceptability of smoking measures and low smoking prevalence, since the future risks are uncertain and unknown, caution or ban have been under the table for discussion and there is still some misunderstanding on how electronic cigarettes are less dangerous as opposed to traditional tobacco smoking. Studies reveal that 40–60% approve that they are less risky and 25% of UK smokers are uncertain if E-cigarettes are in fact less dangerous (Heide Weishaar, 2016). Despite this, in 2016 Public Health England, the executive agency in charge of the nation's well-being, declared that "E-cigarettes were 95% less harmful than normal cigarettes" (Braillons, 2016) (Farrimond, 2017).

It is in terms of health that the public tends to disagree, with studies leading us on different directions due to the lack of available information. The strong and quick adoption of electronic cigarette use across the globe has split the public in health community. Bell & Keane defend that this is because health positions are nowadays made with basis on moral stances "*(…) it is not clear that further research into e-cigarettes will substantially alter opinion. This is because*

the dangers stem not merely from the constituents of the products themselves, but the ideological challenge they pose (...)" (Farrimond, 2017).

Despite the global increase in electronic cigarette consumption, the product's safety is still a mystery because the currently available data is not reliable to enable to generate a study which determines the health impact of electronic cigarettes, so we cannot state the real effects of E-cigarettes, for example, on future cancer. While traditional cigarette smoke contains more toxicants and chemicals than the aerosol of an E-cigarette, again for now it is impossible to state that the aerosol is less harmful for the user. Following the same logical thinking, there is much apprehension concerning non-users' and the environment's safety when exposed to the aerosol (Mastrota, 2017) (Anne Y. Oh & Ashutosh Kacker, 2014).

Scientific evidence needs more time to develop and prove itself as a reliable source of information concerning electronic cigarettes, with allegations and regulations currently made with basis on ideology and not on results (Farrimond, 2017). Until now, what is scientifically known is that an E-cigarette or an Electronic Nicotine Delivery System contains propylene glycol, glycerol, flavourings, nicotine and other chemicals, the harm caused to human beings by these combined components not possible to measure at the moment. To add to this, manufacturers of electronic cigarettes claim that their products are constantly undergoing chemical, toxicological and clinical tests and affirm that the chemical exposure from an E-cigarette is lower than the one allowed by the FDA in other situations. Considering this, manufacturers state that their products are safer than traditional tobacco cigarettes (Hyman & Brown, 2017).

Finally, there is also evidence that people prefer to abstain from smoking tobacco cigarettes and instead use electronic cigarettes, as opposed to NRT methods or quitting aids, but in fact a great number of E-cigarette users continue to smoke tobacco cigarettes, calling themselves "Dual-Users". In fact, studies made in the USA and South Korea revealed that 75% of electronic cigarette smokers still use tobacco cigarettes or tobacco products, thus maintaining their exposure to smoke-related toxicants (Harrell, et al., 2015) (Henkler & Luch, 2014). This has triggered negative considerations about the E-cigarette, because those "Dual-Users" are traditional tobacco cigarette users that use electronic cigarette to cope in non-smoking areas. Another concern posted is the attractiveness for electronic cigarettes for non-smoking youths of electronic cigarettes, who were initially turned off by the consequences of tobacco smoking. They now see these E-cigarettes as an opportunity to be "cool" with less consequences. However, this action could make a non-smoker into a traditional tobacco cigarette smoker or into a nicotine addict after some time (Farrimond, 2017).

2.2.2.1 – The Consumer's profile

Recent studies have revealed that the use of electronic cigarettes differs on age, gender, economic status and in level of education.

The Electronic Liquid Cigarette have their consumers well distributed among age groups but with special emphasis on the age group "Older" [3], have more females consumers and the users of this type of product have a higher level of education and a higher income. In the Electronic Heated-Tobacco Cigarette, the group age that consume more is the "Young", females and the level of education and income of these users is considered high (Dawkins, Turner, Roberts, & Soar, 2013) (Piñeiro, et al., 2016) (Trumbo & Harper, 2016) (Brose, Simonavicius, & Cheeseman, 2018) (Miyazaki & Tabuchi, 2018).

2.2.3 – What is the main purpose of the Electronic cigarette?

After considering the above information, we now come to a topic that needs to be addressed to fully understand the divergence of ideas about electronic cigarettes. There are two sides to this topic, with critics and supporters of E-cigarettes sharing different ideas and opinions about these products. It was based on those ideas that the hypothesis and research questions of this study were developed.

Although this topic is about the purpose of electronic cigarettes, the available literature suggests two different purposes: one, to give up smoking and the other, as a means of attracting new smokers who eventually become addicted to nicotine.

The community has been continuously on disagreement concerning the impact of electronic cigarettes on the cessation of traditional tobacco smoking. On one side, supporters who believe that electronic cigarettes came to minimize the traditional tobacco smoking population, basing their statements in studies that verify the strong effectiveness of tobacco abstinence by using electronic cigarettes compared to the traditional NRT methods. Should this be correct, E-cigarettes could be the one valid alternative to NRT in the field of smoking cessation and a way for tobacco harm reduction (Hyman & Brown, 2017) (Braillons, 2016). Vaping enjoyment plays a crucial role in smoking cessation, some researchers going as far as saying that this activity can be considered as a hobby (Farrimond, 2017).

[3] Age group "Young" – 18-34; Age group "Older" – 35->55

On the other hand, there are critics complaining about these researches stating that they are incorrect or that they could lead to misinterpretation, because studies confirm that 93% of smokers who tried NRT products went back to traditional tobacco smoking after six months. On the other hand, smokers who never tried an E-cigarette before are more likely to abstain from traditional tobacco cigarettes than the ones who are E-cigarette users. Although they reduced their traditional cigarette consumption, E-cigarette users were no more likely than traditional tobacco smokers to give up smoking for good (Hyman & Brown, 2017). This idea gains strength when the tobacco industry changed its mind and start seeing NRT products as business opportunities instead of seeing them as health threats like they have always been. All this is due to a federal law alteration introduced in 2009, in the USA, which allows tobacco companies to commercialize NRT products. This led the tobacco industry to start producing and marketing their own NRT products to compete with NRT pharmaceutical products, with the ultimate aim of leading the nicotine market. This was known because the documents which were published by the industry show that NRT products were used as a complement of smoking rather than for cessation (Apollonio & Glantz, 2017).

Furthermore, critics are concerned with the youth population's attraction to electronic cigarettes, saying that all progress made in tobacco control over the last 50 years could be affected (Braillons, 2016). College students say that the enjoyment of Electronic Liquid Cigarette smoking has surpassed the objective of giving up smoking, and that makes perfect sense since we have a variety of flavours, such as fruit or alcohol, which according to critics were designed to attract new customers among the youth population, encouraging them to start vaping. Critics are likewise concerned about the safety of specific flavours (Farrimond, 2017). Once again, we must bear in mind that the information so far collected on the impact of electronic cigarettes in tobacco cigarette smoking cessation is still reduced. For example, in terms of health, we cannot yet confirm that electronic cigarettes contribute to full traditional tobacco cigarette smoking cessation (Hyman & Brown, 2017).

2.2.4. Electronic Liquid Cigarettes

Electronic Liquid Cigarettes were the revolutionary device of this industry by becoming the first type of portable electronic utensil that could replicate the act of smoking. Their popularity rose due to several characteristics that traditional cigarettes could not offer in terms of innovation. Firstly, and as mentioned before, smoke production and the fact of being a less harmful solution; secondly and precisely because this type of electronic cigarette offered the

possibility of having a "tailored" cigarette. A choice for every smoker, like flavours, equipment shape customization, the amount of smoke produced, and nicotine levels of the liquid were a few of the key factors that contributed to the product's early success. Last, but not least, these cigarettes were strongly seen as an option and viable way to quit smoking, an important point that attracted part of the smoking community to opt for this product.

Being a pioneer product is never easy and along with all the successes and new customers came some criticism and concerns were the new routines and change of habits, like charging of the device, refilling the liquid, the fact that both battery and resistance needed to be switched and be properly maintained. Lastly, after some studies undertaken in the health area, questions about the quality and safety of the liquids started being asked and so the efficacy of these devices in aiding to quit smoking effectively as advertised was not confirmed due to users' incapacity to quantify their daily smoking amounts.

Other studies reported differences between electronic cigarettes and traditional tobacco cigarettes, like the challenge to obtain nicotine from an E-cigarette due to the differences in the puffing technique which requires practice. A "perfect" electronic cigarette is therefore not yet established because users frequently switch brands, types and generations (Anne Y. Oh & Ashutosh Kacker, 2014).

Since we have been observing a constant development of the E-cigarette, in the future these will be more accurate in the delivery of nicotine doses eradicating the present issues concerning noncompliance or ease of use (Farrimond, 2017) (Hyman & Brown, 2017).

2.2.4.1 – Brief Market Review

In 2018, it is possible to distinguish four types of electronic cigarettes available in the market. There are the disposables ones, similar in shape to traditional tobacco cigarettes and that you can only use once. The other three types are rechargeable, the first-generation type is cigarette shaped, and includes a battery and usually doesn't have buttons. This has been named as a "closed" system due to the impossibility of being refilled and their privation of customization by the user (previously loaded with cartridges by manufacturer). The second-generation is a pen style, bigger than a cigarette with refillable container and comes with buttons. The last type is called third-generation and consists of a large size tank style, rechargeable with manual switches. The second and the third E-cigarette generation are identified as "open" system because these generations can be refilled with liquids and customized by the user (Jankowski, Brozek, Lawson, Skoczynski, & Zejda, 2016) (Vardavas, et al., 2017).

There are now at least 466 different brands of electronic cigarettes in the market (Blank, et al., 2016). One of the pioneer brands of E-cigarettes was Njoy, founded by Mark Weiss in 2006, a year before the launch of electronic cigarettes in the USA market. While Njoy still preserves its independence from the traditional tobacco industry, Blu another popular E-cigarette brand was bought by Lorillard Tobacco Company in 2012, being divested in 2015 due to the merger of RJ Reynolds and Lorillard Tobacco Company in 2014. This divestment was made to give space to Vuse, the brand launched in 2013 by RJ Reynolds Vapor Company. Another big and popular brand of E-cigarettes owned by traditional tobacco companies is MarkTen, also launched in 2013. MarkTen was launched by Altria Group (bought by Philip Morris) in late 2013, the second tobacco industry company which that year launched its own electronic cigarette brand in the market, and six years before the entrance of E-cigarettes in the USA market (Haardörfer, et al., 2017).

E-cigarette liquids/juices or supply recharges can differ too. These are usually bought in prefilled containers that vary in volume and price from shop to shop and can also be bought online. There are 466 known brands currently available in the market, with the possibility of being filled by more than 7700 flavour categories (Blank, et al., 2016).

Liquids also vary a lot among flavours, the sweet and fruity tastes being the preferred ones among former smokers and youths, while tobacco flavours being preferred by dual users. Nowadays it seems natural for users to switch flavours as they look for the perfect one, sometimes mixing them to create unique tailor-made flavours (Blank, et al., 2016).

2.4.5 - Electronic Heated-Tobacco Cigarettes

I Quit Ordinary Smoking - IQOS from Philip Morris International, this device that heats tobacco was introduced in the market to revolutionize the way people smoke and to be a viable and less dangerous alternative to traditional tobacco cigarettes. Philip Morris International already states that this will be their focus and they will change their future to a smoke-free company in the future. Philip Morris was able to replicate the feeling of smoking on a device that is loved by the majority of users for its fashionable design. Additionally, and because it is a Philip Morris International product, a trusted multinational that is constantly under watch by health organizations and having invested more than three billion Euros on the development of IQOS, users believe that this product will be a more trusted and controlled product in terms of safety and less dangerous for human beings as opposed to Electronic Liquid Cigarettes (Morris,

2018) (Brose, Simonavicius, & Cheeseman, 2018) (Caputi, Leas, Dredze, Cohen, & Ayers, 2017) (Kress, 2017).

2.4.5.1 – Brief Market Review

In 2018, in Portugal there are more than one type of Electronic Heated-Tobacco Cigarette, but the only one recognized by the individuals of the interviews (next chapter) was IQOS, the model 2.4.

In Portugal, the device IQOS costs 70 Euros, and comes with a 2-year warranty and maintenance included. The price for recharge packs, called HEET's has a similar price as traditional tobacco packs (4,5€). HEET's sticks have three flavours available in the market one called Amber - Intense tobacco, the other called Yellow - Less intense tobacco and the last one called Turquoise – with a menthol flavour. Just like in traditional tobacco cigarettes.

In Portugal, IQOS has an online store and in 2018 the brand opened a physical store in Lisbon, 3 Pop Up Stores in the shopping centres, Centro Comercial Amoreiras, Centro Comercial Vasco da Gama and in NorteShopping. HEET's sticks can be purchased in over 20 Galp Gas Stations across Portugal.

Given that the IQOS is a recent product in the Portuguese market, its points of sale are still reduced in number when compared to traditional tobacco cigarettes retailers. They are already available for sale in a few shopping centers and in gas stations across Portugal. In terms of flavours, it is the opposite of Electronic Liquid Cigarettes with only three types available. As a standard product, it means that the IQOS cannot be customized, the only option for the user lying in selecting the colour of the machine (Morris, 2018).

There are more brands of this type of E-cigarette available in Portugal like the *Ploom* by PAX but these brands have been sold in Electronic Liquid Stores with a substantial higher price (Vapes, 2018).

Chapter 3 - Research Methodology's

3.1 - Research Method

A research method is a procedure used to explore and analyse a topic, explaining how you will undertake the research on the subject. This process is driven to find new outcomes of the theme. In this dissertation two primary researches were conducted, one qualitative and the other quantitative with the purpose of understanding the acceptance, barriers and opportunities of electronic cigarettes in the Portuguese market and community.
A quantitative and qualitative studies are both important and distinct in the research process. A quantitative investigation is made with the purpose of having a richer approach on understanding the attitudes and motivations about the topic and a qualitative inquiry serves to quantify the product's preference, by connecting the findings in the qualitative research vis-à-vis consumers thoughts. (Barnham, 2015).

3.1.1 – Research Guidelines

In order to give an answer to the research questions of this study, in-depth interviews and an online survey were performed to analyse important features of electronic cigarettes, their influence on the satisfaction of the consumer and the profile of the consumer.

3.2 - Research Instruments

3.2.1 – In-depth interviews and Testimonials (Qualitative research)

In order to develop an appropriate qualitative research, 48 individuals were interviewed, as this study is focused on understanding acceptance, barriers and opportunities for electronic cigarettes in the Portuguese market and community. As such, the interviews covered non-smokers and all different types of smokers. Besides this, three interviews were previously made to three different stores selling Electronic Liquid Cigarettes and to two Electronic Heated-Tobacco Cigarette (IQOS) salespeople, to understand the different markets, users' consumption habits with the object of conducting a suitable interview and developing an appropriate market analysis of the product.

In order to fully grasp the subject group of "non-smokers", it is essential to break it down into different segments:

- Individuals who never smoked in their lives
- Individuals who previously smoked but quit

And in order to fully grasp the subject group of "smokers", it is also essential to break it down into different segments:

- Traditional tobacco cigarettes users only (Never tried an electronic cigarette / Tried and did not like)
- Individuals who tried an electronic cigarette (liquid) and only use these now
- Individuals who tried an electronic cigarette (heated) and only use these now
- Individuals who tried an electronic cigarette and are dual users (liquid or heated and traditional tobacco cigarettes)
- Individuals who tried electronic cigarettes and went back to smoking traditional tobacco cigarettes

The interviews were made with the purpose of creating a suitable quantitative method of research in order to have the best possible perception of electronic cigarette acceptance. The questions made can be found in the Appendix 1.

General perception of the two main groups:

3.2.1.1 - Non-Smokers

The non-smoking Portuguese population perspective of electronic cigarettes (liquid and heated) could be considered very positive according to interview results. In general, this is seen as a less harmful and cleaner product than traditional tobacco cigarettes. Non-smokers think that users are in fact becoming more responsible in terms of health by smoking these electronic devices instead of traditional tobacco cigarettes. Also, they think that these products are cleaner than traditional tobacco cigarettes. In the case of Electronic Liquid Cigarettes, as the product has no ashes and no filters to throw on the floor or on the ground of a public space these are much cleaner. In the case of the heated E-cigarette, they still have filters. However, the general public considered them cleaner than traditional cigarettes due to less smoke and no ash.

Another advantage that greatly contributes to E-cigarette acceptance by non-smokers is its smoke. Almost all non-smokers say that E-cigarette smoke is less disturbing, even when present in higher quantity. E-cigarette smoke is considered less harmful than traditional cigarette smoke, being scentless most of the time. When it has smell, non-smokers say that it is better than the smell of tobacco even if it is candy or even if its smell is not so good.

A non-smoker referred:

- "*When I go to a closed public place where smoking is allowed, like a bar or a club, I already know that I my clothes will be smelling of tobacco; it would be amazing if this changed. Also, the fact that I must watch out if people are dancing with cigarettes pointing to me is another issue that I hate about tobacco cigarettes; not only are they harming me with their toxic-filled smoke but sometimes they also burn me…For me, as a non-user I consider e-cigarettes politer than traditional cigarettes*".

The divergence comes in when people smoke electronic cigarettes in non-smoking areas. Some non-users do not mind because it is vapour and not smoke, but for others it is still smoke. If the area has a smoking prohibited sign it applies to traditional tobacco cigarettes but also to every device that creates smoke or aerosol.

Two statements were highlighted in order to understand this point:

- *"Smoke is harmful, this is not smoke is vapour. In fact, I don't know if the vapour hurts me or not but I am 100% sure that it is less harmful than tobacco smoke. I have no problem in inhaling this vapour, because it is only produced when people are puffing, whereas traditional tobacco cigarette I not only have to take the smoke when they are puffing, but also when they have a cigarette in their hands or resting in an ashtray. Another aspect that I hate in tobacco cigarettes is when people go and smoke outside because smoking is not allowed. At that moment I have two options, either to go with the person and assume that I have to cope with their habit or stay alone for like 10 minutes which is annoying."*
- *"If I am in a public place where smoking is allowed I obviously prefer to receive the smoke that is less harmful (talking about the smoke of the e-cigarette), but if I am in a place where smoking is not allowed I will not tolerate any type of smoke, even if it is less toxic or not."*

Finally, when asked *"Do you think that electronic cigarettes could help people quit smoking?"* the majority of non-smokers (who never smoked before) said "*yes*" and a few even said that they would encourage smokers to switch to electronic cigarettes. For the rest of non-smokers (who never smoked before) in general, they will not encourage anyone to smoke but instead just to stop, and when asked *"Do you think that electronic cigarettes could help people quit smoking?"* this minority answered "*no*" or "*that is not quitting, it is smoking a less harmful thing"* and a few answered saying that "*these devices are and will be smoked by the future generation, a tactic used by the tobacco industry to retain and gain more clients, they (the tobacco industry) are the ones who will win the battle against tobacco"*.

Of course, former smokers who tried and quit smoking as a result of electronic cigarettes, consider this a valid method to quit smoking.

In terms of differentiating the perception of non-users about Electronic Heated-Tobacco Cigarettes or Electronic Liquid Cigarette is not so different, with non-users that never smoked seeing them as an equal socially acceptable form of smoking, while at the hand non-users who were former smokers seem to perceive heated tobacco as form of "*cleaner*" smoking and the liquids as a method for quitting smoking.

3.2.1.2 – Smokers

The smoking Portuguese population's perspective of electronic cigarette acceptance is very clear, but it could be segmented based on the results of the interviews, which enabled to conclude that age is one of the main factors influencing the use of electronic cigarettes.

According to these interviews, it was seen that younger people (under 34 years old) prefer electronic heated tobacco cigarettes, called IQOS. As the top selling heated tobacco brand, it is acknowledged by all its users and non-users, users saying that this product is the one that really mimics the traditional tobacco cigarette. Most of them tried this product out of curiosity and not while looking for a healthier smoking option. However, when they try and like the product, they stick to IQOS saying that they have "*always acknowledged the harmful effects of traditional tobacco smoking and by using electronic heated cigarettes they are moving up a step into having a healthier future*". Another point of concern among the younger population is the money spent on recharges. The price of IQOS recharges is very identical to the price of a pack of traditional tobacco cigarettes. One common thought that could be highlighted is *"Having made an initial 70 Euro investment on the machine, now everything is the same. I spend the same amount of money on recharges that I would normally spend on a pack of*

cigarettes". Regardless of the model and generation, electronic cigarettes require the adoption of new routines, namely that IQOS users must charge the battery of their devices, purchase their recharges at gas stations and in a few shopping centres. So far, battery charging has not been a problem for heated tobacco cigarette users, and when they forget to charge them or when they die, users say that charging them is quick. If they are really in need for a "*break or a smoke*", sometimes they borrow the machine from co-workers or from a friend to smoke their own recharge. *"It´s just like borrowing a lighter… After my cigarette, I give back the machine and put mine on charge".* [4] Lastly, the majority of heated tobacco cigarettes users say that they now smoke more than before in terms of the number of cigarettes, one of the causes being the lower intensity of heated tobacco which leads users to smoke more than what they usually smoke. Most of them smoke traditional tobacco cigarettes in the presence of alcohol, and that could be the main reason why there are more dual users of Electronic Heated-Tobacco Cigarettes in the interviews, than Electronic Liquid Cigarettes and consequently more people returning to traditional tobacco cigarette smoking only.

The older generation (above 34 years old) prefers Electronic Liquid Cigarettes, because on average they have been smoking electronic cigarettes and on average when they started vaping, IQOS was not yet in the market, despite saying that their product "*suits the purpose of smoking and that is enough for them"*. Due to the diverse range of available models, generations and brands the interviewees were not capable of recalling the brand which they normally buy, recharge brand and not even which E-cigarette generation they have in their possession.

- "*I really don't know, I'm used to going to the shop to replace batteries, resistors or buy nicotine, sometimes I can buy an e-liquid, but usually I buy the liquids online*." - said a user.

This generation is more concerned about its health, affirming that they are making an investment on their well-being by smoking this product because it has given proof of helping to quit traditional cigarette consumption.

In terms of routines they seem to adapt easier than the young generation, making efforts and improving in order to go along with the product. A question about new routines was made and the answer was *"In the beginning it was hard to adapt, but now I have everything under control, I have two devices, one always with me and the other on my desk at work, a lot of batteries, chargers and liquids scattered around the house, car and office so that I can smoke whenever I want".*

[4] Observations show that IQOS is very well distributed and spread among electronic cigarette users

Interviews showed that there are less dual users among Electronic Liquid Cigarette users than among Electronic Heated-Tobacco Cigarette users and consequently there is a higher number of individuals who gave up tobacco cigarette smoking for good.

The perception of electronic heated tobacco cigarette users of Electronic Liquid Cigarettes is very negative. Electronic Heated-Tobacco Cigarette users claim that using this product is not smoking but vaping, and instead of vaping a synthetic liquid whose characteristics have not been scientifically studied in depth, concerning its health dangers and harms, they vape a product controlled by a company that has been in the tobacco industry for a long time.

Another disadvantage lies in the shape of the product itself. For example, IQOS users say that users of electronic liquid tobacco cigarettes are not able to replicate the experience of smoking, saying that it is just another form of nicotine delivery for addicts and not for smokers.

Addiction is another important point, heated tobacco cigarette users saying that Electronic Liquid Cigarette smokers do not know when they should stop smoking. *"I have 6 minutes to smoke my recharge or 14 puffs and when the machine light turns red I know that it is finished, whereas if I was vaping liquid I do not know when to stop"* – said an IQOS user.

Lastly, the price is also questioned because it is more expensive than a pack of tobacco cigarettes and more expensive than Electronic Heated-Tobacco Cigarette recharges.

On the other hand, the perception of Electronic Liquid Cigarette users of heated tobacco cigarettes is negative too, accusing users of electronic heated tobacco cigarette of smoking and not vaping because they are still using tobacco, condemning heated tobacco for being more harmful and defending themselves by saying that they only vape liquids with nicotine. And lastly, they defend that their product is more easily adaptable to fulfil their needs (flavours, level of nicotine, quantity of smoke, among others) and above all that it is a method with given proof in helping to quit smoking.

Also important is to understand the perception of traditional tobacco cigarette users as well as the perception of users who tried electronic cigarettes and went back to traditional tobacco cigarette smoking. Traditional tobacco cigarette users' perception of electronic cigarette is diverse, in general accusing this product of not being a method for quitting smoking, "*If it is just for the nicotine and they really want to quit smoke then there is plenty of pharmaceutical help like nicotine patches"* – said a traditional cigarette smoker. The other common perception which makes tobacco cigarette users continue smoking is the new routines (recharging batteries, maintenance, among others) and the lack of offer compared to traditional tobacco cigarette. To be more precise and in accordance with the interviews made, there are general and separate critics of Electronic Liquid Cigarettes like "*It is not even a cigarette*", "*Smoking*

a flavour like candy or a dessert is closer to smoking shisha than smoking a cigarette". Electronic Heated-Tobacco cigarette receives critics like "*It is not powerful enough in terms of smoke, flavour or nicotine delivery*" or that "*It smells bad*".

Smokers who tried electronic cigarettes and went back to traditional tobacco smoking have, logically, a negative opinion of the product. One critic of heated tobacco cigarettes made by traditional tobacco consumers of cigarette brands not included in the Philip Morris group is that the "*recharges are more expensive than cigarette packs*". Electronic liquid cigarettes are commonly criticised by those who never tried and those who have tried them, former users criticising "*the bad quality of the resistors*", "*breaks easily*" and "*sometimes overheats*", opinions that could be important for this study, as this dissertation aims to improve electronic cigarette market performance.

3.2.2 - Online Survey (Quantitative research)

The online survey was the chosen procedure to collect the available data, in this case a questionnaire was made with the purpose of gathering the largest number of responses.

A questionnaire is a sequence of questions which have some advantages for instance: quick and not too expensive method of collecting answers, with the possibility of avoiding bias that might occur when questions are asked face-to-face (White, 2000).

Qualitrics was the research software used to develop and deliver the questionnaire. Afterwards, the questionnaire was sent via e-mail and shared on social media via Facebook and WhatsApp platforms.

Since this study is concerned with the improvement of electronic cigarette market performance, the questionnaire needed to cover as many customers as possible, including current customers, possible future customers and former customers in order to perceive what triggered them to take the decision to start consuming or quit electronic cigarettes. To add to this and to make the electronic cigarette consumer section more relevant, known users (heated or liquid) were contacted via Facebook asking them to fill in the questionnaire.

The questions were made with the output of the literature review combined with the interviews with the purpose of answering the research questions. The ultimate aim was to develop a linear regression model to test the overall satisfaction of electronic cigarettes taking into consideration different features/characteristics.

The layout of this research can be found in the Appendix 2.

3.3 – Measurement scales

In this dissertation study, Likert scales have been used, allowing individuals to classify their opinion in the different questions proposed in order to understand the level of concordance with each sentence. Scales like the level of satisfaction ("very dissatisfied" to "very satisfied") and others were used in order to build the most suitable statistical analysis.

The target of this questionnaire was the Portuguese market and Portuguese consumers, and thus the reason for this questionnaire to be made only in Portuguese.

Chapter 4 – Analysis of results

4.1 – Collection

The survey was online between the 10th and 22nd of March. *Qualitrics* software was used to deliver the questionnaire and was possible to observe that 354 started the questionnaire but only 317 finished it, meaning a conclusion rate of almost 90% which is considered acceptable to serve the study's purpose.
Finally, after the data collection, the data was analysed on SPSS software 23.0.

4.2 – Sample Characterization

To understand the sample and to better analyse their perceptions and opinions, a demographic segmentation was made in order to grasp the data.
In Gender, the sample is characterized by 58.4% of females and 41.6% of males. In Age, the sample is distributed in 46.4% in the ages between 18 and 24, in 23% in the ages between 25 and 34, in 13.6% between the ages of 35 and 44 and the rest of the sample is above 45 years old, representing the remaining 17%. To be aligned with the literature review that mentioned that young and older people have different perceptions about the electronic cigarettes, the sample was segmented in two groups "Young" (18 - 34) and "Older" (35 - 100). Also, these age groups were made aligned with the interviews in order to perform the best possible study.
Regarding the Education, the sample have 16.4% of the individuals in a low level of education and the remaining data corresponds to a high level of education[5]. To add to that, and to mention that 48.3% has a bachelor's degree and 33.1% of the sample have a master's degree as level of education. Considering Income, the vast majority of the sample (71,6%) as an income lower than 1500€ per month.
Finally, 58% of the sample are smokers and 42% are non-smokers. Of those 58%, 10% were only Electronic Liquid Cigarette users, 39% were only Electronic Heated-Tobacco Cigarette users, 38% were only Traditional Tobacco users and the rest of the sample were Dual-Users. (Dual-User with Electronic Liquid Cigarette – 1%, Dual-User with Electronic Heated-Tobacco Cigarette – 12%).[6]

[5] In high level of education were considered - bachelor's degree, master's degree, PhD and others
[6] Rounded Percentages

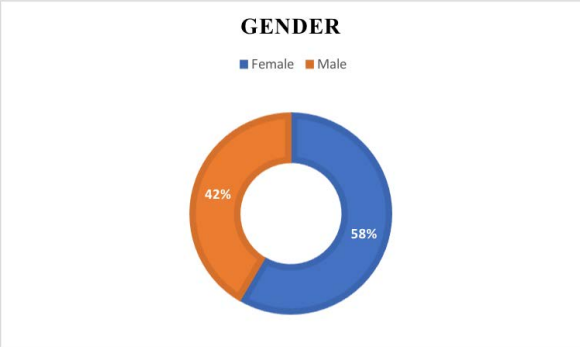

Figure 1 – Gender of the Sample

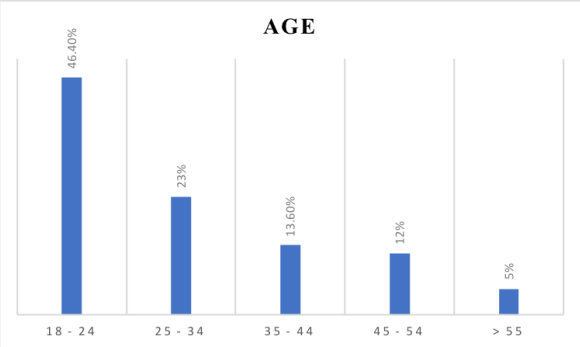

Figure 2 – Age of the Sample

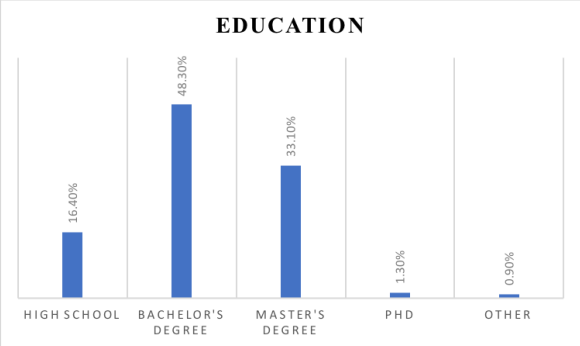

Figure 3 – Education of the Sample

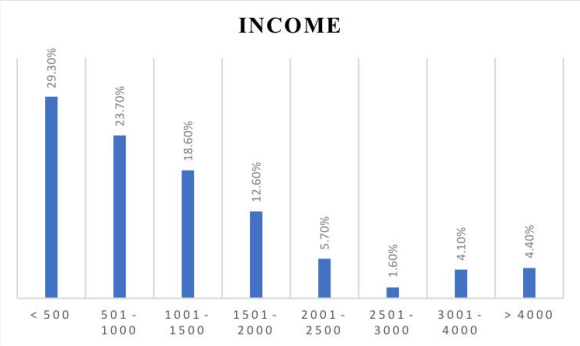

Figure 4 – Income of the Sample

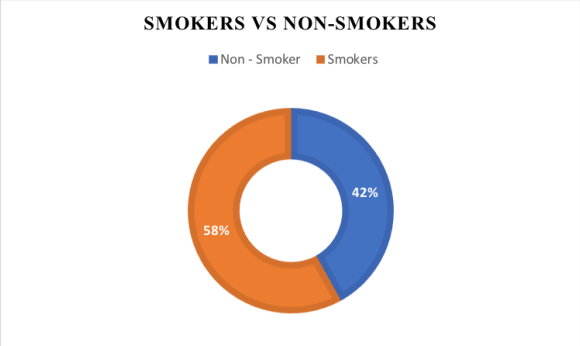

Figure 5 – Smokers Vs Non-Smokers

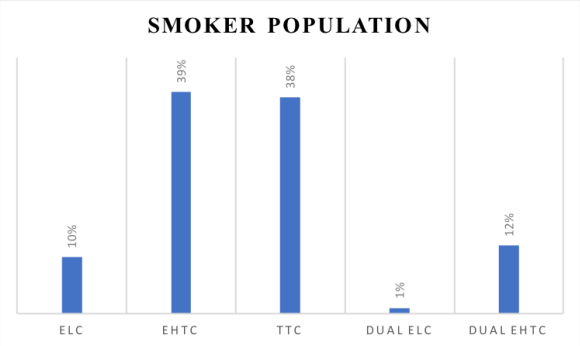

Figure 6 – Characterization of the Smokers

4.3 – Explorative Analysis

4.3.1 - Descriptive Statistics Non-Smoker Population

The Non-Smoker population is characterized in this sample for having 66% of the population in the "Young" group, for being almost equally distributed in terms of gender, for having 80% with a higher level of education and for their income being less than 1501€ (70.2%). With the data collected it is possible to state that the majority of the Non-Smoker population follows a healthy life-style. 71% of the individuals "agree/strongly agree" when asked the level of concordance with the sentence *"Do you consider that you are a person who follow a healthy life-style"*.

Approximately 60% of Non-Smokers, said that electronic cigarettes are the cigarettes more accepted in society and the remaining 40% state that the cigarette most accepted in society is the traditional one.

Several statements[7] about the electronic cigarette were made to non-smokers in order to understand their acceptation of this product. To the statement *"The electronic cigarette is less harmful than traditional tobacco to the human health"*, 45 % had "agree/strongly agree" and 35 % had respond "neither agree/neither disagree". When said *"There have been an increasing in electronic cigarette consumers"* almost 70% had "agree/strongly agree". Also, the smoke and the smell of an electronic cigarette were considered less inconvenient, than the smoke of traditional tobacco, by the Non-Smoker population in 71.6% and in 57.4% respectively.

Among the Non-Smoker population, 6 individuals state that they would like to try Electronic Liquid Cigarettes and 7 state that they would like to try the Electronic Heated-Tobacco Cigarettes. The reasons were varied among the individuals but most of them would like to try "*because I have already tried traditional tobacco and I would like to see if like this electronic cigarette"*. Finally, when asked *"if you would be a user of an electronic cigarette if there was any study that proves that electronic cigarettes help in the process of weight loss/ control"* almost 4.8% said that would be and 4.4% didn't know if they would be a user or not.

From the Non-Smoker population, 54 were ex-smokers, 11% left their addiction by shifting from traditional tobacco cigarettes to Electronic Liquid Cigarette. Of those which used this method to quit smoke, 84% had "agree/strongly agree" when asked if the purpose of using

[7] With a Likert scale from strongly disagree to strongly agree

this electronic cigarette was to pursuit a healthier lifestyle, but just 66.7% of those started using this product with the actual purpose of quitting smoke.
When asked if their intentions of quit smoking were due to health problems, the majority of the individuals, had "disagree/ strongly disagree" but if was due to a pursuit of a healthier lifestyle 84% of the answers were "agree/strongly agree".
Less than 3% used Nicotine Replacement Treatments to quit smoke and there were no answers of ex-smokers who quit smoking by the use of Electronic Heated-Tobacco Cigarette.

4.3.2 - Descriptive Statistics Smoker Population

Among the Smoker population, which include traditional tobacco cigarette users, electronic cigarette users and Dual-Users, it is possible to state that they also follow a healthier lifestyle. 60.9% of the individuals "agree/strongly agree" when asked the level of concordance with the sentence *"Do you consider that you are a person who follow a healthy life-style"*. Just 17.7% said that "disagree/strongly disagree" from the sentence.
Starting with traditional tobacco smokers, 36.7% state that they follow a healthier lifestyle and 38.4% state the opposite. This group is characterized by having 65% on the group age "Young", in terms of gender for being 65% females, for having 73.3% of the individuals with a higher level of education and for having 73.3% with a monthly income lower than 1501€. When asked to this group if they know about electronic cigarettes, they know the both existent types of electronic cigarettes, and after collecting the data was possible to observe, that 78% sate that the smoke of the electronic cigarette is not similar to the smoke provided by the traditional tobacco, also 84% declares that the smell is not identical of the traditional tobacco cigarette and 90% sate that the experience of smoking and E-cigarette is not the same. Although, 47% "agree/strongly agree" that an electronic cigarette is less harmful than the traditional tobacco cigarette and 37% "neither agree/neither disagree".
Of this group 17% were electronic cigarette users and went back to traditional cigarette smoking. 12% were Electronic Liquid Cigarette users and the main reasons pointed to give up of these devices were "*Flavour*", "*Battery*", "*Incapacity of adaption to new routines*" and for not being a valid method "*to quit smoke*". The remaining 5% were Electronic Heated-Tobacco Cigarette users, the main reasons to give up of this device were the same except the variable "*Battery*" (Appendix 3 and 4).
The Electronic Liquid Cigarette smoker's population is characterized in this sample by gender for being 60% of females, by having 55% of the individuals in the age group "Older",

for having 65% with a higher level of education and for having 75% of the individuals with a monthly income of less than 2001€.
Among them, 75% consider them self as a person who follow a healthier lifestyle and when said that their E-cigarette *"mimics the experience of smoking a traditional tobacco cigarette"* 60% had "agree/strongly agree".
The Electronic Heated-Tobacco Cigarette smoker's population is characterized in this sample by gender for being 68.1% of females, by having 79.2% of the individuals in the age group "Young", for having 96% with a higher level of education and for having a similar distribution among the monthly income, specially between the 501€ and the 2500€. Of this sample, 87.5% "agree/strongly agree" that their E-cigarette *"mimics the experience of smoking a traditional tobacco cigarette"* and again 87.5% consider them self a person who follows a healthier lifestyle.
The individuals considered Dual-Users were the ones that answered that at the they smoke traditional tobacco cigarettes and vape/smoke electronic cigarettes. In the case of the Dual-Users that use Electronic Liquid Cigarette, the sample is very small but composed only per males, 50% of the males are in the age group "Young", also 50% have and higher level of education and the income of this group is situated only between 501 to 1500. The Dual-Users that use Electronic Heated-Tobacco Cigarettes is composed by 59.1% of females, for having 81.8% in the group age "Young", for having again 81.8% in the education group "High" and the monthly income of "501-1000" was the one with more individuals (40.9%).

4.3.3 – Hypotheses Testing

The following analysis, of the hypotheses made based on the chapters Two and Three, aim to answer to the research questions of this study.

Regarding the Research Question 1: *Do consumers of traditional tobacco cigarettes shift from traditional tobacco cigarettes to electronic cigarettes in order to pursuit a healthier lifestyle?*

The following suppositions were made:[8]

[8] In this research question and in the suppositions, the answers from individuals considered Dual-Users were left out due to the fact that this question is addressed to users that shifted from traditional tobacco to electronic cigarettes, so consequently they only smoke/ vape electronic cigarettes.

Supposition #1: *Consumers see this product as a form to quit traditional tobacco smoking*

Of this sample, 89.5% of traditional tobacco cigarette users that shifted their consumption of traditional tobacco to Electronic Liquid Cigarette see this product as a viable manner of quitting smoke. The 83.3% of the traditional tobacco cigarette users that shifted their consumption of traditional tobacco to Electronic Heated-Tobacco Cigarette see this product as a viable manner of quitting smoke too.

Supposition #2: *Consumers see this product as a less dangerous product than traditional tobacco* cigarette

Of this sample, 94.8% of Electronic Liquid Cigarette users see this product as less harmful product than traditional tobacco cigarette. The same happened with the Electronic Heated-Tobacco Cigarette, 100% see this product as less harmful product than traditional tobacco cigarettes.

Supposition #3: *Electronic cigarettes turned out to be a life improvement to the user*

Of this sample, 60% of the Electronic Liquid Cigarette users state that vaping their E-cigarette improved in terms of health and well-being and 100% state that their change from traditional tobacco consumers to this product was due to their concern with a healthier lifestyle. In the same page, 95.8% of the Electronic Heated-Tobacco Cigarette users state that smoking their electronic device improved their quality of life in terms of health and well-being and 97.2% state that their change from traditional tobacco consumers to this product was due to their concern with a healthier lifestyle.

Observe Appendix 5, Figure 7 to 14.

Regarding the Research Question 2: *What are the features/characteristics that influence the most the overall satisfaction of the consumers of electronic cigarettes? (the ones with a higher effect on the satisfaction)*

The following hypothesis were made:

Hypothesis #1: *Those feature/characteristics predict the overall satisfaction of the consumer in the consumption of their electronic cigarette*

List of features/characteristics:

- *Price of the device*
- *Price of the recharge*
- *A device that is operated by a battery*
- *Quality of the battery*
- *Flavour*
- *Diversity of flavours*
- *Smell*
- *Smoke*
- *Level of Nicotine*
- *Capacity of Customization*
- *Number of retailers available*
- *To serve the purpose of quit traditional tobacco*
- *To cope in non-smoking areas*

To test these hypotheses and in order to answer to this question a multiple regression analysis was realized in order to understand the perceptions of the electronic users about the features/characteristics highlighted in the chapters Two and Three. Since we are in the presence of a multiple regression analysis there is the necessity to check for multicollinearity. The presence of multicollinearity may cause inappropriate statistical interpretations due to a strong linear association among the independent variables. So, there is multicollinearity in two cases, when the VIF is higher than 10 and when the tolerance is lower than 0.2. (Chennamaneni, 2015).
No multicollinearity was found on the regression model's. Observe Appendix 11 to 13.

Regression analysis were made to test these hypotheses but unfortunately and due to the fact of this sample is highly composed for smokers of Electronic Heated-Tobacco Cigarette, the regressions containing Electronic Liquid Cigarette users did not give statistically significant results on the independent variable and by those reasons the regressions considered to answer to this hypothesis test were the ones which include Electronic Heated-Tobacco Cigarette users. The regression of Dual-Users which use Electronic Liquid Cigarettes was not possible to compute due to the low number of answers corresponding those characteristics. The tables of the other regressions could be observed as well in the Appendix 8 to 10 and levels of satisfaction by percentage could be seen in Appendix 14 to 19.

Regression - Electronic Heated-Tobacco Cigarette with Dual-Users

The results of the regression analysis showed that we are in the presence of a satisfactory model in terms of quality because of the outcome variable and the predictor variable have, between them, a correlation of 0.668 (R = 0.668). Also, the model assembled describes 35.4% of the changeability in the overall satisfaction of electronic cigarettes. (Adjusted R square = 0.354).

Also, we can observe by the generated ANOVA table that ($F = 4.833$, $p < .001$), among the 13 variables included, there are four variables that predict the *overall satisfaction*. The variables that have influence are "*A device that is operated by a battery"* ($B = 0.172$, $t = 0.45$, $p < 0.05$), "*Flavour*" ($B = 0.378$, $t = 0.02$, $p < 0.05$), "*Level of Nicotine*" ($B = 0.178$, $t = 0.43$, $p < 0.05$) and "*Capacity of Customization*" ($B = -0.166$, $t = 0.14$, $p < 0.05$). The statically significance that these variables have on the "*overall satisfaction"* translates in the following: The increase by one scale-point on "*A device that is operated by a battery",* "*Flavour*" or in "*Level of Nicotine*" will increase the *overall satisfaction* in 0.172, 0.378 or in 0.178 respectively. On the opposite, due to the lack of "*Capacity of Customization*" an increase of one scale-point on this variable will decrease the "*overall satisfaction"* in 0.166.

There are three variables which positively affect the *overall satisfaction* and one that affect negatively the *Overall Satisfaction* of the Electronic Heated-Tobacco Cigarette. The remaining variables don't have a statically significant effect on the *overall satisfaction.* (p-value > 0.05).

All the tables could be seen in the Appendix 6.

Regression - Electronic Heated-Tobacco Cigarette without Dual-Users

Once again, the results of this regression analysis presented a satisfactory model in terms of quality because of the outcome variable and the predictor variable have, between them, a correlation of 0.644 (R = 0.644). Also, the model assembled describes 28.3% of the changeability in the overall satisfaction of electronic cigarettes. (Adjusted R square = 0.283). By the ANOVA generated it is possible to see that at least one variable has a significant effect on the *overall satisfaction* ($F = 3.161$, $p < .005$). The only variable that have a statically significant impact is "*Flavour"* ($B = 0.455$, $t = 0.01$, $p < 0.05$) which means that, the increase by one scale-point on "*Flavour*" will increase the "*overall satisfaction"* in 0.455. The remaining variables do not have a statically significant effect on the "*overall satisfaction"* (p-value > 0.05).
All the tables could be seen in the Appendix 7.

Regarding the Research Question 3: *What is the profile of the consumers of electronic cigarettes in Portugal?*

The following hypothesis were made:[9]

Hypothesis #2: *The daily consumption of electronic cigarette differs based on gender*

To access this hypothesis an independent sample t-test was made to observe if there were differences in the daily consumption between females and males.

Electronic Liquid Cigarette users only:
On average the consumption appears to be higher on females (Mean = 22.5) however the differences were not statistically significant on this case ($t = 0.613$, p-value = .548). Consequently, this hypothesis is rejected.

[9] In this research question and in the hypothesis, the answers were made separately. Due to the lack of individuals with the specific characteristics of a *"Dual-User of Electronic Cigarette only"* the tests for this category were not assembled.

Electronic Heated-Tobacco Cigarette users only:
On average the consumption appears to be higher on males (Mean = 13.82) however the differences were not statistically significant on this case (t = - 1.720, p-value = .090).
Consequently, this hypothesis is rejected.

Dual-Users of Electronic Heated-Tobacco Cigarette only:
On average the consumption appears to be higher on males (Mean = 13.25) however the differences were not statistically significant on this case (t = 1.691, p-value = .107).
Consequently, this hypothesis is rejected.

Hypothesis #3: *The daily consumption of electronic cigarette differs based on age*

To access this hypothesis an independent sample t-test was made to observe if there were differences in the daily consumption between "Young" and "Older" age groups.

Electronic Liquid Cigarette users only:
On average the consumption appears to be higher on the age group "Older" (Mean = 28.18) and the differences were statistically significant on this case (t = - 2.962, p-value = .009).
Consequently, this hypothesis is accepted.

Electronic Heated-Tobacco Cigarette users only:
On average the consumption appears to be higher on age group "Young" (Mean = 12.57) however the differences were not statistically significant on this case (t = 0.921, p-value = .360).
Consequently, this hypothesis is rejected.

Dual-Users of Electronic Heated-Tobacco Cigarette only:
On average the consumption appears to be higher on age group "Older" (Mean = 13.67) however the differences were not statistically significant on this case (t = - 0.941, p-value = .358).
Consequently, this hypothesis is rejected.

Hypothesis #4: *The daily consumption of electronic cigarette differs based on education*

To access this hypothesis an independent sample t-test was made to observe if there were differences in the daily consumption between "Lower" and "Higher" education groups.

Electronic Liquid Cigarette users only:
On average the consumption appears to be higher on the education group "High" (Mean = 22.31) however the differences were not statistically significant on this case (t = - 0.610, p-value = .550).
Consequently, this hypothesis is rejected.

Electronic Heated-Tobacco Cigarette users only:
On average the consumption appears to be higher on the education group "High" (Mean = 12.38) however the differences were not statistically significant on this case (t = - 0.788, p-value = .434).
Consequently, this hypothesis is rejected.

Dual-Users of Electronic Heated-Tobacco Cigarette only:
On average the consumption appears to be higher on the education group "High" (Mean = 10.11) however the differences were not statistically significant on this case (t = - 0.434, p-value = .669).
Consequently, this hypothesis is rejected.

Hypothesis #5: *The daily consumption of electronic cigarette differs based on income*

To assemble this test, a one-way analysis ANOVA of variance was conducted to observe if there were differences in the daily consumption between Income groups.

Electronic Liquid Cigarette users only:
On average the consumption appears to be higher on the income group of "2001-2500" (Mean = 50.00) however the differences were not statistically significant on this case (F = 1.525, p-value = .251).
Consequently, this hypothesis is rejected.

Electronic Heated-Tobacco Cigarette users only:

On average the consumption appears to be higher on the income group of "2501-3000" (Mean = 15.67) however the differences were not statistically significant on this case (F = 0.442, p-value = .848).

Consequently, this hypothesis is rejected.

Dual-Users of Electronic Heated-Tobacco Cigarette only:

On average the consumption appears to be higher on the income group of "2501-3000" (Mean = 15.00) however the differences were not statistically significant on this case (F = 0.236, p-value = .870).

Consequently, this hypothesis is rejected.

Observe Appendix 20 to 23.

Chapter 5 – Conclusion

5.1 – Study Validation

The results gathered and analysed in the previous chapter correspond with the literature and with qualitative research. This study aims to address the Portuguese market of the electronic cigarettes through the perceptions of the consumers in order to improve the market and also is a surplus to enrich the literature available. More than that, this study makes a differentiation between the two types of electronic cigarettes available in Portugal, the differentiation between the existing types of electronic smokers and the perceptions of the general population about the electronic cigarettes.
Also, since the only Electronic Heated-Tobacco Cigarette available in Portugal is IQOS from Philip Morris, this study could be a resource to marketers of IQOS, or for other brands of electronic cigarettes (Liquid or Heated-Tobacco) that want to enter in the Portuguese market and a starting point for other study's.

It is possible to conclude with this study that almost all ex-smokers of traditional tobacco cigarette that shifted from traditional tobacco to electronic cigarette consumption intend to pursuit a healthier lifestyle and is even possible to state that the electronic cigarette turned out to be a life improvement to the user.
Furthermore, the majority of the electronic cigarette users see this product as a less dangerous product compared to traditional tobacco cigarettes, in detail 94.7% of the Electronic Liquid Cigarette users agree that their product is less dangerous and only 5.3% disagree in this matter. In the Electronic Heated-Tobacco Cigarette case, all the sample agree that this product is less harmful than the traditional tobacco cigarette.
Finally, the majority of the users which have switched from traditional tobacco to electronic cigarettes see their product as a way of quit smoke permanently.

In terms of the satisfaction was not possible to make a statistically significant regression to Electronic Liquid Cigarette users, although a descriptive frequency was made in order to highlight the features/characteristics of their own electronic device, that the individuals referred, as the ones who gave more satisfaction.
In the case of the ones which only use Electronic Liquid Cigarettes, and aligned with the literature, the features/characteristics that most satisfied the user are "*Flavour*" (95% choose

satisfied/ very satisfied), "*Diversity of Flavours"* (80% choose satisfied/ very satisfied), the *"Smoke"* (90% choose satisfied/ very satisfied), the "*Level of Nicotine"* (75% choose satisfied/ very satisfied), the *"Capacity of Customization"* (90% choose satisfied/ very satisfied). Considering the respective Dual-Users, the same characteristics could be highlighted but with different levels of satisfaction, being *"Flavour"* a feature/characteristic that satisfied/ very satisfied 95.7% of the correspondent's users. The only two features/characteristics that had a lower level of satisfaction were the *"Diversity of Flavours"* and the *"Capacity of Customization",* that only 68.1% and 40.4% of the correspondent's users choose satisfied/ very satisfied, respectively.
Once again, aligned with the literature it is possible to notice, in this sample, that more than 78% of the users of Electronic Liquid Cigarette, state that the feature/characteristic *"To cope in non-smoking areas"* influence the use of their device.

Due to the fact of a great amount of the individuals be an Electronic Heated-Tobacco Cigarette user, a regression model was made only to users of IQOS and to correspondents Dual-Users. The results for the ones who only use IQOS, "Flavour" is the only statistically significant variable which have a positive effect on the "*Overall Satisfaction*". This matches once again the literature and the interviews made, and a sentence from the interviews could be highlighted to justify this outcome - *"I like this taste because it tastes like tobacco and in fact it is tobacco"*.
In the regression that encompasses the Dual-Users, the variables that were statistically significant, were "*A device operated by a battery*", "*Flavour*", "*Level of Nicotine*" and "*Capacity of Customization*". The first three variables mentioned have a positive effect on the "*Overall Satisfaction*" and the fourth has a negative effect.

Lastly, several analyses were made to understand the socio-demographic characteristics of the Portuguese consumers and again, in concordance with the literature and with the interviews, is possible to state that "Older" age group consume more Electronic Liquid Cigarettes than the "Young" age group.

Chapter 6 – Limitations and Future Research

6.1 – Limitations

This study, as mentioned before, is one of the firsts studies that addresses to the electronic cigarette Portuguese market, however this study has some limitations.

The first limitation is the assumption that every electronic cigarette user is a social network user. To add to that, the questionnaire was shared online, which could make the sample biased because it was sent to possible electronic cigarette consumers with more effort than to non-consumers, in order to find more possible individuals of this small market. Related with the questionnaire other limitation is the reach power of the author since this was only distributed by him.

Other limitation is the size and diversification of the sample, 220 of the 317 individuals are in the "Young" age group, more than that, there are no individuals with less than 18 years old. Furthermore, there are only two individuals that are Electronic Liquid Cigarette and Traditional Tobacco Cigarette user (Dual-User). Also, there were no individual that have started to smoke/vape without being a traditional tobacco consumer before and this study doesn't consider user that switched from Electronic Liquid Cigarettes to Electronic Heated-Tobacco Cigarettes or vice-versa.

This study as the purpose of address the Portuguese market of electronic cigarettes according to consumer's perception. Consequently, since that there was no recognition of brands, on the interviews, by the users of Electronic Liquid Cigarettes the study treated all the brands as a whole. On the other hand, the consumers of Electronic Heated-Tobacco Cigarettes just recognized one brand – IQOS. So, the assumption made is that in Portugal the electronic cigarette consumers doesn't have brand awareness and the only Heat Not Burn type of electronic cigarettes consumed in Portugal is IQOS.

Another limitation concerning the lack of brand awareness of Electronic Liquid Cigarettes, because the questionnaire treats all the answers as similar and individuals could have different level of satisfaction due to different brands. Also, it was find difficult to measure the "number of uses" of an Electronic Liquid Cigarette by the user and to measure the levels of nicotine

consumed by all the users. Price could be considered as a limitation because in Electronic Liquid Cigarettes is not fixed as in traditional tobacco cigarettes.

Finally, related to the Electronic Heated-Tobacco Cigarette, since this product (IQOS) was launched in to the public in 2014 the literature available is minimal and therefore this type of electronic cigarette was also treated under assumptions of general electronic cigarettes scientific literature but also on the Electronic Liquid Cigarettes literature.

6.2 – Future Research

Based on the study results and in order to improve the Portuguese market of electronic cigarettes, a few suggestions are made to improve this market and help the respective marketers:

- Study and analyse, if in fact, this type of cigarettes helps in life improvement
- In the case of the Electronic Liquid Cigarettes, try new approaches to encounter the younger segment
- In the case of the Electronic Heated-Tobacco Cigarette, study the possibility of customization of IQOS
- Study if there is a correlation between weight loss/control and the use of electronic cigarettes

For future research and in order to enrich the study, considerations about electronic cigarette smokers that start smoking/vaping without being traditional tobacco cigarette smokers before would increase the quality of the existent literature and their perceptions could be a significant marketing insight to marketers or producers.

More information and analyses about other Electronic Heated-Tobacco Cigarette brands would be interesting to add to this study and also literature about the reasons that lead the FDA of prohibiting the entrance of IQOS in the USA electronic cigarette market.

Furthermore, studies measuring the real impact of the electronic cigarettes in the human being would have an impact in all the literature about electronic cigarette made so far and will discredit some studies and emphasize others. Also, analyse the different types of Heat Not Burn tobacco products that Philip Morris is developing, like the Carbon Type, in order to understand the acceptation by the consumer of this prototype.

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List of abbreviations

EHTC – Electronic Heated-Tobacco Cigarette

ELC – Electronic Liquid Cigarette

FDA – Food and Drug Administration

NRT – Nicotine Replacement Therapy

TTC – Traditional Tobacco Cigarettes

UK – United Kingdom

USA – United States of America

VIF – Variance Inflation Factors

Appendices

Appendix 1

Interviews:

- The questions were made to all the users mentioned in chapter 3.
- Not all the questions were made to all of the interviewed, they were asked according to the answers given, and the questions above aren't in the order that were questioned.
- Additional questions were made if the interviewed answer something different than the others

Q – Do you, consider yourself as a person who, follow a healthier lifestyle?

Q – Do you smoke?

Q – Which type of cigarettes do you smoke?

Q – What is your perception about Electronic Cigarettes?

Q – Have you already tried an E-cigarette? If Yes, which?

Q – Tell me the main features that cause you more satisfaction, when you vape/smoke your E-cigarette.

Q – Tell me the main features that cause you "discomfort", when you vape/smoke your E-cigarette.

Q – Tell me the main features that give you more satisfaction, of your E-cigarette.

Q – Tell me the main features that give you "discomfort", of your E-cigarette.

Q – Regarding other types of electronic cigarettes, what is your opinion (Liquid VS Heated)?

Q – Do you know the brand, the type or the model of your device?

Q – What price did you pay for your device? Are you comfortable with the price? What are the price of your recharges? Where do you usually buy them? And what is the level of nicotine that you are inhaling?

Q – Did you ever considered starting smoke an E-cigarette? Why?

Q – Which methods did you use to quit smoking?

Q – Did you suffer weight variances after quitting smoke?

Q – Imagine this scenario: There are studies that proof that E-cigarette can be helpful to weight loss/control. Do you consider to be a user?

Q – Why did you change from Traditional Tobacco Cigarette to Electronic Cigarettes?

Q – Do you consider yourself as smoker, a vaper or both?

Q – Do you consider you consider yourself healthier than before? (Traditional Tobacco Cigarette user shifts to Electronic Cigarettes)

Q – Socio Demographic questions (Age, Gender, Education)

Appendix 2
Survey:

Q0 Agradeço desde já a sua disponibilidade para responder às seguintes perguntas. Este estudo faz parte da minha Tese de Mestrado pela Universidade Católica Portuguesa, na área de inovação de produto. Este estudo destina-se a analisar o mercado dos cigarros electrónicos em Portugal e, nesse sentido, analisar fumadores e não fumadores. Não existem respostas certas ou erradas e estas são confidenciais tendo como único fim a utilização para este estudo. O preenchimento deste questionário demorará cerca de 7 minutos. Obrigado pela sua ajuda.

Q1.1 Considera que é uma pessoa que segue um estilo de vida saudável?
Options: Discordo completamente (1); Discordo (2); Nem discordo nem concordo (3); Concordo (4); Concordo completamente (5)

Q1.2 Qual julga ser o cigarro mais socialmente aceitável?
Options: O cigarro tradicional (1); O cigarro electrónico (ex: cigarros electrónicos c/ líquido (Canetas de Vaping, Tanques de Vaping) ou cigarros electrónicos de tabaco aquecido (IQOS by Philip Morris)) (2)

Q1.3 É fumador(a)?
Options: Sim (1); Não (2)

Q1.4 Respondeu à pergunta anterior que não era fumador(a). No entanto, indique por favor qual a melhor opção que se aplica ao seu caso:
Options: Não sou fumador, nem nunca fumei (1); Não sou fumador, mas já fui no passado (2)

Q1.5 Qual dos seguintes tipos de cigarro tem mais curiosidade em experimentar?
Options: Cigarro tradicional (1); Cigarro Electrónico (2), Nenhum (3)

Q1.6 Que tipo de cigarro electrónico tem mais curiosidade em experimentar?
Options: Cigarros Electrónicos com líquido (Canetas de Vaping, Tanques de Vaping) (1); Cigarros Electrónicos de tabaco Aquecido (IQOS by Philip Morris) (2)

Q1.7 Por favor indique o seu nível de concordância com as seguintes afirmações: "Tenciono experimentar um cigarro electrónico..."
Method: Likert Scale - 1 - Discordo completamente (1); 2 - Discordo (2); 3 - Não concordo nem discordo (3); 4 - Concordo (4); 5 - Concordo Completamente (5)
Options: (...) por ser uma novidade (1); (...) por ser diferente (2); (...) pelo preço (3); (...) pelos diversos sabores que existem (4); (...) pelo o cheiro que proporciona (5); (...) pelo fumo que proporciona (6); (...) por ser a bateria e poder ser recarregado (7); (...) pela possibilidade de poder fumar em espaços fechados (8); (...) pela disponibilidade em varias lojas (9); (...) pelo nível de nicotina que possuem (10); (...) por ser menos prejudicial para a saúde comparando com um cigarro tradicional (11); (...) porque já experimentei um cigarro normal e gostava de experimentar um cigarro electrónico para ver se gosto (12)

Q1.8O que o/a levou a deixar de fumar? Por favor indique o seu nível de concordância com as seguintes afirmações.
Method: Likert Scale - 1 - Discordo completamente (1); 2 - Discordo (2); 3 - Não concordo nem discordo (3); 4 - Concordo (4); 5 - Concordo Completamente (5)
Options: Dexei de gostar (1); Preocupação com um estilo de vida saudável (2); Problemas de saúde (3); Questões financeiras (4); Quis fazer uma pausa nos cigarros sem motivo aparente (5)

Q1.9 A que métodos recorreu para deixar de fumar?
Options: Produtos terapêuticos de nicotina (1); Cigarros Electrónicos com líquido (Canetas de Vaping, Tanques de Vaping) (2); Cigarros Electrónicos de tabaco aquecido (IQOS by Philip Morris) (3) ; Nenhum, deixei simplesmente (4); Outro (5)

Q1.10 Por favor indique o seu nível de concordância com as seguintes afirmações: "Experimentei um cigarro electrónico..."
Method: Likert Scale - 1 - Discordo completamente (1); 2 - Discordo (2); 3 - Não concordo nem discordo (3); 4 - Concordo (4); 5 - Concordo Completamente (5)
Options: (...) por ser uma novidade (1); (...) por ser diferente (2); (...) por ser menos prejudicial para a saúde comparando com um cigarro tradicional (3); (...) pelo preço (4); (...) pelos diversos sabores que existem (5); (...) pelo o cheiro que proporciona (6); (...) pelo fumo que proporciona (7); (...) por ser a bateria e poder ser recarregado (8); (...) pela possibilidade de poder fumar em espaços fechados (9); (...) pela disponibilidade em varias lojas (10); (...) pelo nível de nicotina

que possuem (11); (...) por uma preocupação com um estilo de vida mais saudável (12); (...) quis fazer uma pausa nos cigarros tradicionais sem motivo aparente (13); (...) com o objectivo de deixar de fumar (14)

Q1.11 Desde que deixou de fumar, o seu peso aumentou?
Options: Discordo completamente (1); Discordo (2); Não concordo nem discordo (3); Concordo (4); Concordo completamente (5)

Q1.12 Por favor indique o seu nível de concordância com as seguintes afirmações:
Method: Likert Scale - 1 - Discordo completamente (1); 2 - Discordo (2); 3 - Não concordo nem discordo (3); 4 - Concordo (4); 5 - Concordo Completamente (5)
Options: O cheiro do cigarro electrónico incomoda menos que o cheiro do cigarro tradicional (1); O fumo do cigarro electrónico incomoda menos que o fumo do cigarro tradicional (2); O cigarro tradicional é socialmente menos aceitável que o cigarro electrónico (3); Os cigarros electrónicos são mais atractivos pois têm mais sabores disponíveis (4); Os cigarros electrónicos são mais atractivos pois têm uma maior capacidade de personalização que os cigarros tradicionais (5); Existem cada vez menos fumadores de cigarros tradicionais (6); Existem cada vez mais fumadores de cigarros electrónicos (7); O cigarro electrónico é menos prejudicial para a saúde que o cigarro tradicional (8)

Q1.13 Caso existissem estudos que comprovassem que a utilização de um cigarro electrónico ajuda no processo de perda/ controlo de peso, ponderava ser utilizador cigarros electrónicos?
Options: Discordo completamente (1); Discordo (2); Não concordo nem discordo (3); Concordo (4); Concordo completamente (5)

Q1.14 Que tipo de fumador é:
Options: Fumo apenas cigarros tradicionais (1); Fumo apenas cigarros electrónicos (2); Fumo cigarros tradicionais e cigarros electrónicos (3); Outro (qual) (4)

Q1.15 Já experimentou cigarros electrónicos?
Options: Sim, já fui utilizador de cigarros electrónicos mas voltei aos cigarros tradicionais (1); Sim, mas apenas através de outros utilizadores de cigarros electrónicos (2); Não (3)

Q1.16 Conhece algum dos cigarros electrónicos apresentado? Pode seleccionar mais que uma opção
Options: Cigarros Electrónicos com liquido (Canetas de Vaping, Tanques de Vaping) (1); Cigarros Electrónicos de tabaco Aquecido (IQOS by Philip Morris) (2)

Q1.17 Por favor indique o seu nível de concordância com as seguintes afirmações relativamente a cigarros electrónicos:
Method: Likert Scale - 1 - Discordo completamente (1); 2 - Discordo (2); 3 - Não concordo nem discordo (3); 4 - Concordo (4); 5 - Concordo Completamente (5)
Options: O fumo é idêntico ao de um cigarro normal (1); O cheiro é idêntico ao de um cigarro normal (2); Considero que um cigarro electrónico é menos prejudicial para a saúde do que um cigarro tradicional (3); A experiência é idêntica (4); Considero que seja uma forma para fumar em espaços fechados (5); Considero que um fumador ao fumar um cigarro electrónico acaba por fumar em maior quantidade (6)

Q1.18 Por favor indique o seu nível de concordância com as seguintes afirmações: "Experimentei um cigarro electrónico..."
Method: Likert Scale - 1 - Discordo completamente (1); 2 - Discordo (2); 3 - Não concordo nem discordo (3); 4 - Concordo (4); 5 - Concordo Completamente (5)
Options: (...) por ser uma novidade (1); (...) por ser diferente (2); (...) por ser menos prejudicial para a saúde comparando com um cigarro tradicional (3); (...) pelo preço (4); (...) pelos diversos sabores que existem (5); (...) pelo o cheiro que proporciona (6); (...) pelo fumo que proporciona (7); (...) por ser a bateria e poder ser recarregado (8); (...) pela possibilidade de poder fumar em espaços fechados (9); (...) pela disponibilidade em varias lojas (10); (...) pelo nível de nicotina que possuem (11); (...) por uma preocupação com um estilo de vida saudável (12); (...) quis fazer uma pausa nos cigarros tradicionais sem motivo aparente (13)

Q1.19 Que tipo de cigarro electrónico experimentou? Pode seleccionar mais do que uma opção.
Options: Cigarros Electrónicos com liquido (Canetas de Vaping, Tanques de Vaping) (1); Cigarros Electrónicos de tabaco Aquecido (IQOS by Philip Morris) (2)

Q1.20 Por favor indique o seu nível de concordância com as seguintes afirmações relativamente a cigarros electrónicos:

Method: Likert Scale - 1 - Discordo completamente (1); 2 - Discordo (2); 3 - Não concordo nem discordo (3); 4 - Concordo (4); 5 - Concordo Completamente (5)
Options: O sabor é idêntico ao de um cigarro normal (1); O fumo é idêntico ao de um cigarro normal (2); O cheiro é idêntico ao de um cigarro normal (3); Considero que um cigarro electrónico é menos prejudicial para a saúde do que um cigarro tradicional (4); A experiência é idêntica (5)

Q1.21 Por favor indique o seu nível de concordância com a seguinte informação: "Deixei de utilizar cigarros electrónicos devido..."
Method: Likert Scale - 1 - Discordo completamente (1); 2 - Discordo (2); 3 - Não concordo nem discordo (3); 4 - Concordo (4); 5 - Concordo Completamente (5)
Options: (...) a considerar ser mais prejudicial que os cigarros tradicionais (1); (...) a ser mais caro que os cigarros tradicionais (2); (...) ao fumo produzido ser menor que os dos cigarros tradicionais (3); (...) ao cheiro produzido ser pior que os dos cigarros tradicionais (4); (...) à inferior oferta comparando com os cigarros tradicionais (5); (...) ao sabor ser pior que os dos cigarros tradicionais (6); (...) ao nível de nicotina ser inferior ao dos cigarros tradicionais (7); (...) devido à bateria dos cigarros electrónicos (8); (...) a não conseguir adapta-me às novas rotinas (9); (...) ao facto de não ser um método viável para deixar de fumar (10)

Q1.22 Foi fumador de cigarros tradicionais?
Options: Sim (1); Não (2)

Q1.23 Fumou cigarros tradicionais aproximadamente durante quanto tempo (número de anos)? (se fumou menos de um ano responda 0)
Option: TEXT ENTRY

Q1.24 Indique por favor o número de meses que fumou cigarros tradicionais:
Options: 1 (1); 2, (2); 3 (3); 4 (4); 5 (5); 6 (6); 7 (7); 8 (8); 9 (9); 10 (10); 11 (11); 12 (12)

Q1.25 O que o fez mudar para cigarros electrónicos? Por favor indique o seu nível de concordância com as seguintes frases.
Method: Likert Scale - 1 - Discordo completamente (1); 2 - Discordo (2); 3 - Não concordo nem discordo (3); 4 - Concordo (4); 5 - Concordo Completamente (5)

Options: Preocupação com um nível de vida mais saudável (1); Vejo este produto como uma forma viável de deixar de fumar (2); Vejo este produto como um produto menos prejudicial que os cigarros tradicionais (3)

Q1.26 Que tipo de cigarro electrónico é que fuma/vaporiza?
Options: Cigarros Electrónicos com liquido (Canetas de Vaping, Tanques de Vaping) (1); Cigarros Electrónicos de tabaco Aquecido (IQOS by Philip Morris) (2)

Q1.27 Quantas vezes utiliza, por dia, o seu cigarro electrónico? Por favor indique um número aproximado
Options: TEXT ENTRY

Q1.28 Qual o número de recargas (HeetSticks) que fuma/vaporiza por dia? Por favor indique um número aproximado
Options: TEXT ENTRY

Q1.29 Por favor indique o seu nível de satisfação considerando as seguintes características/ atributos do seu cigarro electrónico?
Method: Likert Scale - 1 – Muito Insatisfeito (1); 2 - Insatisfeito (2); 3 – Nem Insatisfeito Nem Insatisfeito (3); 4 - Satisfeito (4); 5 – Muito Satisfeito (5)
Options: Preço do aparelho (1); Preço por recarga (2); Ser um aparelho a bateria (3); A qualidade da bateria (4); O sabor (5); A diversidade de sabores disponíveis (6); O cheiro produzido (7); O fumo produzido (8); Nivel de nicotina (9); Capacidade de poder customizar (10); Pela disponibilidade existente de retalhistas para comprar o aparelho ou as recargas (11); Ser um aparelho que pode ajudar a deixar de fumar cigarros tradicionais (12); O facto de poder fumar em espaços fechados (13); Satisfação global (14)

Q1.30 Quais das seguintes características/atríbutos o/a levaram à utilização do seu cigarro electrónico? Por favor indique o seu grau de concordância.
Method: Likert Scale - 1 - Discordo completamente (1); 2 - Discordo (2); 3 - Não concordo nem discordo (3); 4 - Concordo (4); 5 - Concordo Completamente (5)
Options: Preço do aparelho (1); Preço por recarga (2); Ser um aparelho a bateria (3); A qualidade da bateria (4); O sabor (5); A diversidade de sabores disponíveis (6); O cheiro produzido (7); O fumo produzido (8); Nivel de nicotina (9); Capacidade de poder customizar

(10); Pela disponibilidade existente de retalhistas para comprar o aparelho ou as recargas (11); Ser um aparelho que pode ajudar a deixar de fumar cigarros tradicionais (12); O facto de poder fumar em espaços fechados (13)

Q1.31 Por favor indique o seu grau de concordância com a seguinte afirmação: "Considero que o meu cigarro electrónico replica a experiência de fumar um cigarro tradicional"
Options: Discordo completamente (1); Discordo (2); Não concordo nem discordo (3); Concordo (4); Concordo completamente (5)

Q1.32 Por favor indique o seu nível de concordância com a seguinte afirmação: "Considero que fumar um cigarro electrónico melhorou a minha qualidade de vida (ex: saúde, bem estar, ...)"
Options: Discordo completamente (1); Discordo (2); Não concordo nem discordo (3); Concordo (4); Concordo completamente (5)

Q1.33 Por favor indique o seu género:
Options: Feminino (1); Masculino (2)

Q1.34 Por favor indique a sua idade:
Options: TEXT ENTRY

Q1.35 Por favor indique o seu nível de escolaridade:
Options: Ensino Básico (1); Ensino Secundário (2); Licenciatura (3); Mestrado (4); Doutoramento (5); Outro (6): TEXT ENTRY

Q1.36 Por favor indique o seu nível de rendimento mensal:
Options: Menos de 500€ (1); 501 - 1000€ (2); 1001 - 1500€ (3); 1501 - 2000€ (4); 2001 - 2500€ (5); 2501 - 3000€ (6); 3001 - 4000€ (7); Mais de 4000€ (8)

Appendix 3

Variable	Strongly Disagree	Disagree	Neither Disagree/ Neither Agree	Agree	Strongly Agree
Harmful than tobacco	12.5%	12.5%	50%	12.5%	12.5%
Expensive than tobacco	12.5%	25%	50%	0%	12.5%
Less smoke than tobacco	12.5%	25%	50%	12.5%	0%
The smell is worst than tobacco	37.5%	25%	37.5%	0%	0%
Less Retailers	25%	12.5%	37.5%	25%	0%
Flavour is worst than tobacco	0%	0%	37.5%	25%	37.5%
Less Levels of Nicotine than tobacco	12.5%	50%	37.5%	0%	0%
Due to the battery of my device	12.5%	12.5%	37.5%	25%	12.5%
Incapacity of adaption to new routines	0%	25%	25%	37.5%	12.5%
Is not a valid method to quit smoke	0%	0%	25%	37.5%	37.5%

Table 1 – Variable that had influence ex-Electronic Liquid Cigarette to went back to Traditional Cigarette Smoking

Appendix 4

Variable	Strongly Disagree	Disagree	Neither Disagree/ Neither Agree	Agree	Strongly Agree
Harmful than tobacco	20%	20%	20%	20%	20%
Expensive than tobacco	40%	20%	20%	0%	20%
Less smoke than tobacco	40%	20%	20%	20%	0%
The smell is worst than tobacco	40%	40%	10%	0%	0%
Less Retailers	40%	20%	0%	40%	0%
Flavour is worst than tobacco	0%	0%	20%	60%	20%
Less Levels of Nicotine than tobacco	20%	20%	60%	0%	0%
Due to the battery of my device	40%	40%	0%	10%	0%
Incapacity of adaption to new routines	20%	0%	20%	20%	40%
Is not a valid method to quit smoke	0%	0%	0%	20%	80%

Table 2 – Variable that had influence ex-Electronic Heated-Tobacco Cigarette to went back to Traditional Cigarette Smoking

Appendix 5

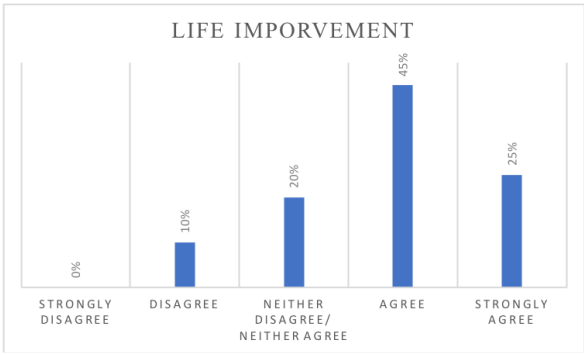


Figure 7 – Life improvement ELC users

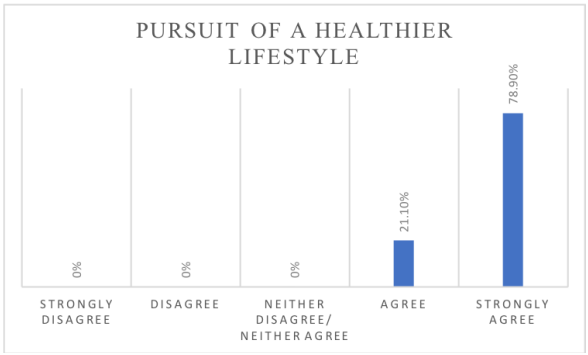


Figure 8 – Pursuit of a healthier lifestyle ELC users

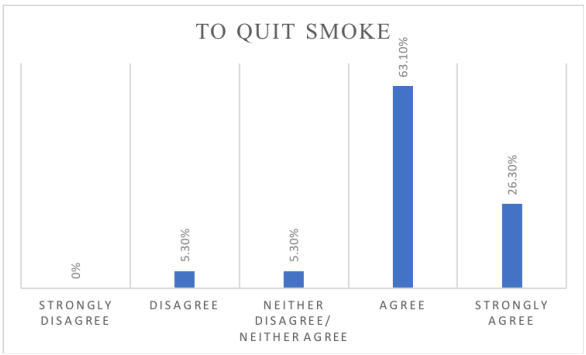


Figure 9 – Quit Smoke ELC users

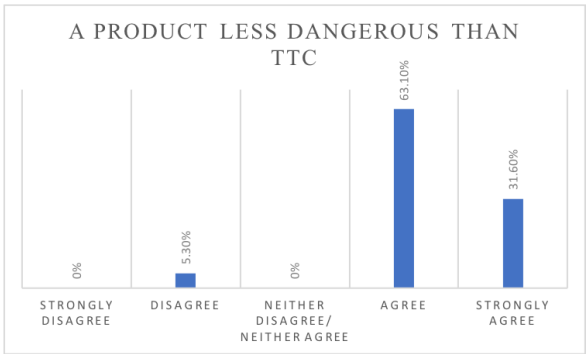
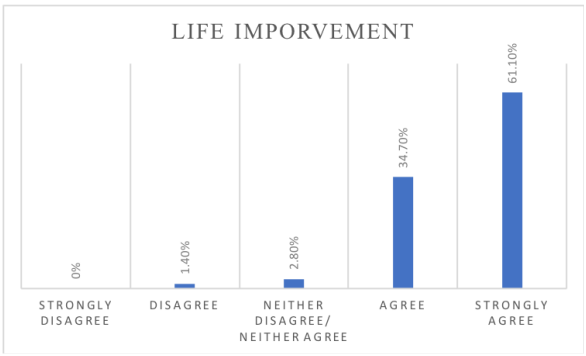


Figure 10 – See ELC as less dangerous



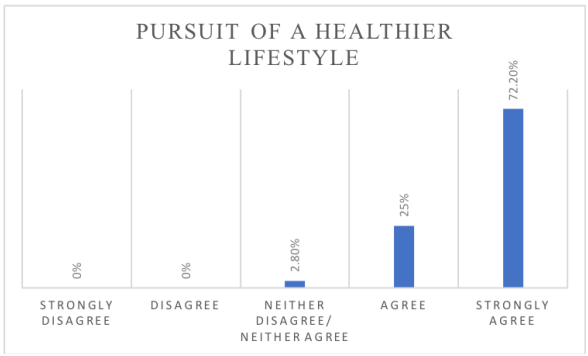


Figure 11 – Life improvement EHTC; Figure 12 – Pursuit of a healthier lifestyle EHTC users

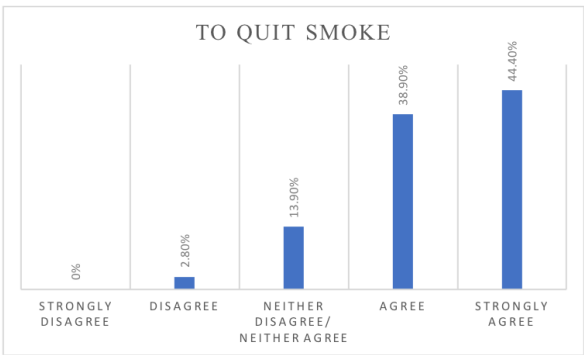


Figure 13 – Quit Smoke EHTC users

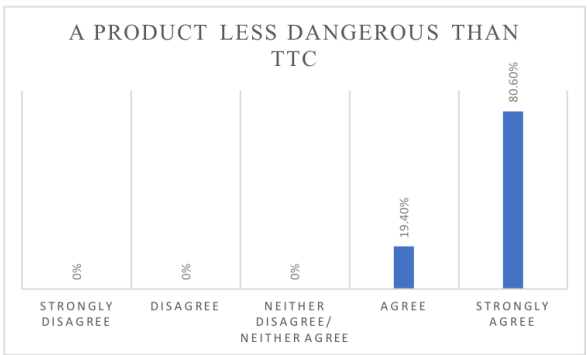


Figure 14 – See EHTC as less dangerous

Appendix 6

Model	R	R Square	Adjusted R Square	Standard Error
1	.668	.446	.354	.487

Table 3 - Regression Model EHTC with Dual Users – Multiple Regression Model Summary

Model 1	Sum of Squares	F	P-value
Regression	14.917	4.833	.000
Residual	18.518		
Total	33.435		

Table 4 - Regression Model EHTC with Dual Users – Multiple Regression Model ANOVA

Model 1	B	Standard Error	t	P-value
Constant	1.594	0.576	2.770	.007
Price of the device	- 0.029	0.058	- 0.506	.614
Price of the recharge	- 0.023	0.084	-0.270	.788
A device that is operated by a battery	**0.172**	**0.085**	**2.036**	**.045**
Quality of the battery	0.045	0.065	0.680	.498
Flavour	**0.378**	**0.118**	**3.203**	**.002**
Diversity of flavours	0.038	0.078	0.494	.623
Smell	- 0.046	0.061	- 0.763	.448
Smoke	0.069	0.098	0.699	.486
Level of Nicotine	**0.178**	**0.087**	**2.054**	**.043**
Capacity of Customization	**- 0.166**	**0.066**	**- 2.521**	**.014**
Number of retailers available	0.092	0.054	1.705	.092
To serve the purpose of quit traditional tobacco	- 0.054	0.070	- 0.771	.443
To cope in non-smoking areas	0.005	0.072	0.074	.941

Table 5 - Regression Model EHTC with Dual Users – Coefficients Significance

Appendix 7

Model	R	R Square	Adjusted R Square	Standard Error
2	.644	.415	.283	0.489

Table 6 - Regression Model EHTC only – Multiple Regression Model Summary

Model 2	Sum of Squares	F	P-value
Regression	9.808	3.161	.001
Residual	13.844		
Total	23.653		

Table 7 - Regression Model EHTC only – Multiple Regression Model ANOVA

Model 2	B	Standard Error	t	P-value
Constant	1.829	0.751	2.435	.018
Price of the device	- 0.004	0.069	- 0.55	.956
Price of the recharge	- 0.119	0.114	-1.047	.299
A device that is operated by a battery	0.123	0.116	1.057	.295
Quality of the battery	0.087	0.102	0.853	.397
Flavour	**0.455**	**0.172**	**2.653**	**.010**
Diversity of flavours	- 0.036	0.090	- 0.395	.694
Smell	- 0.060	0.081	- 0.739	.463
Smoke	0.078	0.109	0.721	.474
Level of Nicotine	0.148	0.108	1.365	.177
Capacity of Customization	- 0.139	0.075	- 1.867	.067
Number of retailers available	0.099	0.068	1.451	.152
To serve the purpose of quit traditional tobacco	- 0.073	0.080	- 0.919	.362
To cope in non-smoking areas	0.038	0.088	0.432	.667

Table 8 - Regression Model EHTC without Dual Users – Coefficients Significance

Appendix 8

Model	R	R Square	Adjusted R Square	Standard Error
3	.804	.646	-.013	0.501

Table 9 - Regression Model ELC with Dual-Users – Multiple Regression Model Summary

Model 3	Sum of Squares	F	P-value
Regression	3.197	0.981	.538
Residual	1.755		
Total	4.952		

Table 10 - Regression Model ELC with Dual Users – Multiple Regression Model ANOVA

Model 3	B	Standard Error	t	P-value
Constant	-1.245	2.474	-0.503	.630
Price of the device	- 0.052	0.180	- 0.287	.782
Price of the recharge	- 0.064	0.193	- 0.333	.749
A device that is operated by a battery	- 0.066	0.223	-0.293	.778
Quality of the battery	- 0.181	0.222	- 0.815	.442
Flavour	0.420	0.296	1.419	.199
Diversity of flavours	0.043	0.234	0.185	.858
Smell	0.310	0.418	0.740	.483
Smoke	0.498	0.253	1.965	.090
Level of Nicotine	- 0.212	0.223	-0.949	.374
Capacity of Customization	- 0.089	0.259	- 0.343	.742
Number of retailers available	0.237	0.157	1.514	.174
To serve the purpose of quit traditional tobacco	0.191	0.156	1.224	.261
To cope in non-smoking areas	0.197	0.310	0.636	.545

Table 11 - Regression Model ELC with Dual Users – Coefficients Significance

Appendix 9

Model	R	R Square	Adjusted R Square	Standard Error
4	.793	.629	- .335	0.573

Table 12 - Regression Model ELC only – Multiple Regression Model Summary

Model 4	Sum of Squares	F	P-value
Regression	2.782	0.653	.753
Residual	1.639		
Total	4.421		

Table 13 - Regression Model ELC only – Multiple Regression Model ANOVA

Model 4	B	Standard Error	t	P-value
Constant	-0.111	3.416	-0.033	.975
Price of the device	- 0.009	0.219	- 0.039	.970
Price of the recharge	- 0.072	0.223	0.321	.761
A device that is operated by a battery	-0.045	0.262	- 0.173	.869
Quality of the battery	- 0.178	0.254	- 0.699	.516
Flavour	0.369	0.399	0.925	.397
Diversity of flavours	0.84	0.279	0.301	.775
Smell	0.188	0.545	0.346	.744
Smoke	0.480	0.364	1.317	.245
Level of Nicotine	- 2.62	0.296	- 0.885	.417
Capacity of Customization	- 0.128	0.316	- 0.407	.701
Number of retailers available	0.312	0.233	1.336	.239
To serve the purpose of quit traditional tobacco	0.161	0.186	0.864	.427
To cope in non-smoking areas	0.107	0.392	0.273	.795

Table 14 - Regression Model ELC only – Coefficients Significance

Appendix 10

Model	R	R Square	Adjusted R Square	Standard Error
5	.873	.762	.321	0.540

Table 15 - Regression Model Dual Users EHTC only – Multiple Regression Model Summary

Model 5	Sum of Squares	F	P-value
Regression	6.533	1.726	.239
Residual	2.038		
Total	8.571		

Table 16 - Regression Model Dual Users EHTC only – Multiple Regression Model ANOVA

Model 5	B	Standard Error	t	P-value
Constant	2.463	1.854	1.329	.226
Price of the device	- 0.324	0.242	- 1.338	.223
Price of the recharge	0.201	0.220	0.914	.391
A device that is operated by a battery	0.189	0.316	0.914	.391
Quality of the battery	- 0.64	0.137	- 0.466	.655
Flavour	0.162	0.286	0.566	.589
Diversity of flavours	0.452	0.305	1.482	0.182
Smell	- 0.047	0.149	- 0.314	.763
Smoke	- 0.271	0.443	- 0.611	.560
Level of Nicotine	0.505	0.310	1.628	.147
Capacity of Customization	- 0.189	0.276	1.628	.147
Number of retailers available	0.174	0.167	1.044	.331
To serve the purpose of quit traditional tobacco	- 0.104	0.368	- 0.283	.785
To cope in non-smoking areas	- 0.211	0.283	- 0.746	.480

Table 17 - Regression Model Dual Users EHTC only – Coefficients Significance

Appendix 11

Model 1	Tolerance	VIF	Model 2	Tolerance	VIF
Price of the device	.859	1.164		.754	1.326
Price of the recharge	.484	2.065		.420	2.382
A device that is operated by a battery	.719	1.392		.579	1.727
Quality of the battery	.559	1.788		.397	2.517
Flavour	.438	2.285		.341	2.935
Diversity of flavours	.591	1.692		.620	1.612
Smell	.511	1.956		.495	2.022
Smoke	.535	1.871		.551	1.814
Level of Nicotine	.697	1.436		.556	1.799
Capacity of Customization	.512	1.953		.464	2.156
Number of retailers available	.656	1.524		.539	1.855
To serve the purpose of quit traditional tobacco	.654	1.530		.651	1.536
To cope in non-smoking areas	.665	1.504		.634	1.578

Table 18 – Multicollinearity Analysis Model 1 and Multicollinearity Analysis Model 2

Appendix 12

Model 3	Tolerance	VIF	Model 4	Tolerance	VIF
Price of the device	.247	4.046		.254	3.943
Price of the recharge	.248	4.029		.269	3.719
A device that is operated by a battery	.301	3.319		.306	3.272
Quality of the battery	.337	2.971		.352	2.840
Flavour	.666	1.501		.653	1.530
Diversity of flavours	.313	3.191		.299	3.349
Smell	.314	8.779		.209	9.103
Smoke	.380	2.631		.255	3.924
Level of Nicotine	.364	2.747		.274	3.656
Capacity of Customization	.559	1.789		.539	1.854
Number of retailers available	.483	2.069		.362	2.764
To serve the purpose of quit traditional tobacco	.551	1.816		.515	1.943
To cope in non-smoking areas	.390	2.563		.374	2.670

Table 19 – Multicollinearity Analysis Model 3 and Multicollinearity Analysis Model 4

Appendix 13

Model 5	Tolerance	VIF
Price of the device	.360	2.775
Price of the recharge	.548	1.825
A device that is operated by a battery	.279	5.585
Quality of the battery	.442	2.264
Flavour	.408	2.170
Diversity of flavours	.265	6.407
Smell	.336	2.977
Smoke	.213	4.691
Level of Nicotine	.387	2.583
Capacity of Customization	.350	2.858
Number of retailers available	.405	2.469
To serve the purpose of quit traditional tobacco	.327	7.893
To cope in non-smoking areas	.282	5,495

Table 20 – Multicollinearity Analysis Model 5

Appendix 14

Variable	Very Dissatisfied	Dissatisfied	Neither Dissatisfied/ Neither Satisfied	Satisfied	Very Satisfied
Price of the device	5%	40%	10%	35%	10%
Price of the recharge	5%	25%	10%	50%	10%
A device that is operated by a battery	0%	20%	45%	25%	10%
Quality of the battery	0%	15%	45%	30%	10%
Flavour	0%	0%	5%	20%	75%
Diversity of flavours	0%	5%	15%	30%	50%
Smell	0%	0%	45%	35%	20%
Smoke	0%	5%	5%	55%	35%
Level of Nicotine	0%	15%	10%	65%	10%
Capacity of Customization	0%	0%	10%	20%	70%
NumberRetailers available	5%	65%	15%	10%	5%
Purpose of quit traditional tobacco	0%	10%	10%	20%	60%
To cope in non-smoking areas	0%	0%	10%	15%	75%
Overall Satisfaction	0%	0%	0%	40%	60%

Table 21 – Level of Satisfaction (%) by ELC users

Appendix 15

Variable	Very Dissatisfied	Dissatisfied	Neither Dissatisfied/ Neither Satisfied	Satisfied	Very Satisfied
Price of the device	2.8%	8.3%	36.1%	36.1%	16.7%
Price of the recharge	0%	4.2%	6.9%	41.7%	47.2%
A device that is operated by a battery	0%	6.9%	62.5%	26.4%	4.2%
Quality of the battery	0%	6.9%	12.5%	38.9%	41.7%
Flavour	0%	0%	4.2%	36.1%	59.7%
Diversity of flavours	0%	12.5%	23.6%	55.6%	8.3%
Smell	1.4%	8.3%	13.9%	33.3%	43.1%
Smoke	0%	2.8%	5.6%	44.4%	47.2%
Level of Nicotine	0%	0%	19.4%	47.2%	33.3%
Capacity of Customization	16.7%	8.3%	50%	15.3%	9.7%
NumberRetailers available	15.3%	34.7%	20.8%	23.6%	5.6%
Purpose of quit traditional tobacco	1.4%	1.4%	25%	34.7%	37.5%
To cope in non-smoking areas	0%	2.8%	33.3%	38.9%	25%
Overall Satisfaction	0%	0%	4.2%	48.6%	47.2%

Table 22 – Level of Satisfaction (%) by EHTC users

Appendix 16

Variable	Very Dissatisfied	Dissatisfied	Neither Dissatisfied/ Neither Satisfied	Satisfied	Very Satisfied
Price of the device	3.2%	14.9%	29.7%	36.2%	16%
Price of the recharge	1.1%	8.5%	7.4%	43.6%	39.4%
A device that is operated by a battery	0%	9.6%	57.4%	27.7%	5.3%
Quality of the battery	0%	8.5%	19.2%	38.3%	34%
Flavour	0%	0%	4.2%	34%	61.7%
Diversity of flavours	0%	10.6%	21.3%	50%	18.1%
Smell	1.1%	6.4%	20.2%	34%	38.3%
Smoke	0%	3.2%	5.3%	46.8%	44.7%
Level of Nicotine	0%	3.2%	17%	52.1%	27.7%
Capacity of Customization	12.8%	6.4%	40.4%	17%	23.4%
NumberRetailers available	12.8%	40.4%	19.2%	22.3%	5.3%
Purpose of quit traditional tobacco	1.1%	3.2%	21.2%	33%	41.5%
To cope in non-smoking areas	0%	2.1%	27.7%	35.1%	35.1%
Overall Satisfaction	0%	0%	4.3%	45.7%	50%

Table 23 – Level of Satisfaction (%) by ELC users and correspondent Dual-Users

Appendix 17

Variable	Very Dissatisfied	Dissatisfied	Neither Dissatisfied/ Neither Satisfied	Satisfied	Very Satisfied
Price of the device	2.65	17.5%	31.6%	36%	12.3%
Price of the recharge	0.9%	8.8%	15.7%	42.1%	32.5%
A device that is operated by a battery	0%	12.3%	53.5%	28.9%	5.3%
Quality of the battery	0.9%	12.3%	17.5%	36%	33.3%
Flavour	0%	0.9%	6.1%	35.1%	57.9%
Diversity of flavours	0.9%	11.4%	22.8%	50%	14.9%
Smell	4.4%	7.9%	19.3%	35.1%	33.3%
Smoke	0%	2.6%	8.8%	50%	38.6%
Level of Nicotine	0%	2.6%	19.4%	52.6%	25.4%
Capacity of Customization	10.5%	7%	43%	20.2%	19.3%
NumberRetailers available	0%	42.1%	17.6%	23.7%	6.1%
Purpose of quit traditional tobacco	1.8%	2.6%	21%	36%	38.6%
To cope in non-smoking areas	0.9%	1.8%	27.1%	35.1%	35.1%
Overall Satisfaction	0%	0%	7%	47.4%	45.6%

Table 24 – Level of Satisfaction (%) by EHTC users and correspondent Dual-Users

Appendix 18

Variable	Very Dissatisfied	Dissatisfied	Neither Dissatisfied/ Neither Satisfied	Satisfied	Very Satisfied
Price of the device	0%	0%	0%	50%	50%
Price of the recharge	0%	0%	0%	50%	50%
A device that is operated by a battery	0%	0%	0%	100%	0%
Quality of the battery	0%	0%	0%	100%	0%
Flavour	0%	0%	0%	100%	0%
Diversity of flavours	0%	0%	0%	50%	50%
Smell	0%	0%	0%	50%	50%
Smoke	0%	0%	0%	50%	50%
Level of Nicotine	0%	0%	0%	100%	0%
Capacity of Customization	0%	0%	0%	50%	50%
NumberRetailers available	0%	0%	0%	100%	0%
Purpose of quit traditional tobacco	0%	0%	0%	100%	0%
To cope in non-smoking areas	0%	0%	0%	100%	0%
Overall Satisfaction	0%	0%	0%	50%	50%

Table 25 – Level of Satisfaction (%) by ELC Dual-Users only

Appendix 19

Variable	Very Dissatisfied	Dissatisfied	Neither Dissatisfied/ Neither Satisfied	Satisfied	Very Satisfied
Price of the device	0%	27.3%	36.3%	36.4%	0%
Price of the recharge	0%	9.1%	50%	36.4%	4.5%
A device that is operated by a battery	0%	22.7%	31.8%	40.9%	4.5%
Quality of the battery	4.5%	27.3%	9.1%	31.8%	27.3%
Flavour	0%	4.5%	13.6%	45.5%	36.4%
Diversity of flavours	4.5%	13.6%	27.4%	50%	4.5%
Smell	18.2%	13.6%	13.6%	41%	13.6%
Smoke	0%	0%	22.8%	63.6%	13.6%
Level of Nicotine	0%	0%	27.3%	59.1%	13.6%
Capacity of Customization	0%	9.1%	50%	36.4%	4.5%
NumberRetailers available	0%	45.4%	9.1%	36.4%	9.1%
Purpose of quit traditional tobacco	4.5%	0%	18.3%	54.5%	22.7%
To cope in non-smoking areas	4.5%	0%	22.8%	40.9%	31.8%
Overall Satisfaction	0%	0%	18.2%	54.3%	27.3%

Table 26 – Level of Satisfaction (%) by EHTC Dual-Users only

Appendix 20

		T-test for Equality of Means		
Daily consumption of ELC	Equal variances assumed	t	P-value	Mean difference
		-2.962	.009	- 17.432

Table 27 - Independent Samples T-test of Hypothesis 3 – ELC users

	Age	N	Mean Consumption
Daily consumption of ELC	Young	8	10.75
	Older	11	28.18

Table 28 - Group Statistics of Hypothesis 3 – ELC users

		T-test for Equality of Means		
Daily consumption of ELC	Equal variances assumed	t	P-value	Mean difference
		.613	.548	4.5

Table 29 - Independent Samples T-test of Hypothesis 2 – ELC users

	Gender	N	Mean Consumption
Daily consumption of ELC	Female	12	22.5
	Male	7	18.0

Table 30 - Group Statistics of Hypothesis 2 – ELC users

		T-test for Equality of Means		
Daily consumption of ELC	Equal variances assumed	t	P-value	Mean difference
		-.610	.550	- 4.641

Table 31 - Independent Samples T-test of Hypothesis 4 – ELC users

	Education	N	Mean Consumption
Daily consumption of ELC	Low	6	17.67
	High	13	22.31

Table 32 - Group Statistics of Hypothesis 4 – ELC users

	Sum of squares	Mean square Consumption	F	P-value
Between groups	1789.026	298.171	1.525	.251
Within groups	2345.5	195.458		
Total	4134.526			

Table 33 - ANOVA of Hypothesis 5 – ELC users

Appendix 21

		T-test for Equality of Means		
Daily consumption of EHTC	Equal variances assumed	t	P-value	Mean difference
		.921	.360	1.371

Table 34 - Independent Samples T-test of Hypothesis 3 – EHTC users

	Age	N	Mean Consumption
Daily consumption of EHTC	Young	57	12.57
	Older	15	11.20

Table 35 - Group Statistics of Hypothesis 3 – EHTC users

		T-test for Equality of Means		
Daily consumption EHTC	Equal variances assumed	t	P-value	Mean difference
		- 1.720	.090	- 2.226

Table 36 - Independent Samples T-test of Hypothesis 2 – EHTC users

	Gender	N	Mean Consumption
Daily consumption of EHTC	Female	50	11.59
	Male	22	13.82

Table 37 - Group Statistics of Hypothesis 2 – EHTC users

		T-test for Equality of Means		
Daily consumption EHTC	Equal variances assumed	t	P-value	Mean difference
		- .788	.434	- 2.382

Table 38 - Independent Samples T-test of Hypothesis 4 – EHTC users

	Education	N	Mean Consumption
Daily consumption of EHTC	Low	3	10
	High	69	12.38

Table 39 - Group Statistics of Hypothesis 4 – EHTC users

	Sum of squares	Mean square Consumption	F	P-value
Between groups	72.899	12.150	0.442	.848
Within groups	1757.467	27.460		
Total	1830.366			

Table 40 - ANOVA of Hypothesis 5 – EHTC users

Appendix 22

		T-test for Equality of Means		
Daily consumption EHTC	Equal variances assumed	t	P-value	Mean difference
		- .941	.358	- 4.5

Table 41 - Independent Samples T-test of Hypothesis 3 – EHTC Dual-Users only

	Age	N	Mean Consumption
Daily consumption of EHTC	Young	18	9.17
	Older	4	13.67

Table 42 - Group Statistics of Hypothesis 3 – EHTC Dual-Users only

		T-test for Equality of Means		
Daily consumption EHTC	Equal variances assumed	t	P-value	Mean difference
		-1.691	.107	-5.558

Table 43 - Independent Samples T-test of Hypothesis 2 – EHTC Dual-Users only

	Gender	N	Mean Consumption
Daily consumption of EHTC	Female	14	7.69
	Male	8	13.25

Table 44 - Group Statistics of Hypothesis 2 – EHTC Dual-Users only

		T-test for Equality of Means		
Daily consumption EHTC	Equal variances assumed	t	P-value	Mean difference
		-.434	.669	- 2.111

Table 45 - Independent Samples T-test of Hypothesis 4 – EHTC Dual-Users only

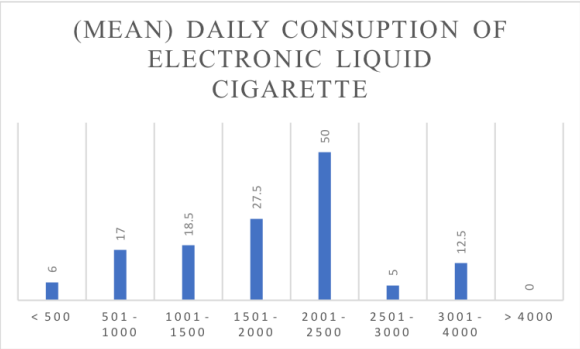
	Education	N	Mean Consumption
Daily consumption EHTC	Low	3	8
	High	19	10.11

Table 46 - Group Statistics of Hypothesis 4 – EHTC Dual-Users only

	Sum of squares	Mean square Consumption	F	P-value
Between groups	46.696	15.565	0.236	.870
Within groups	1122.542	66.032		
Total	1169.238			

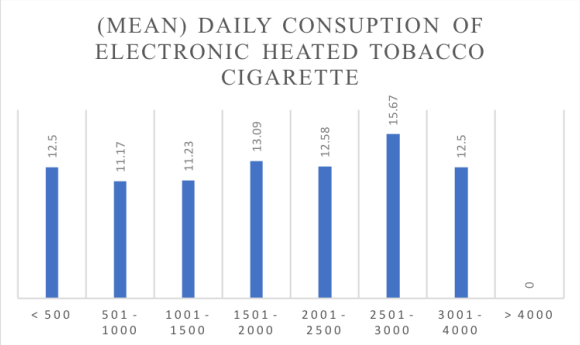
Table 47 - ANOVA of Hypothesis 5 – EHTC Dual-Users only

Appendix 23



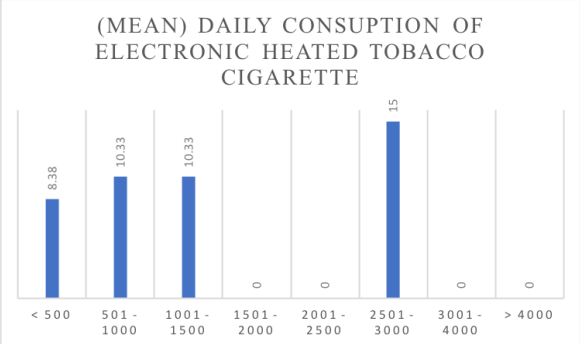
N = 19

Figure 15 – Daily consumption of ELC by ELC users only



N = 72

Figure 16 – Daily consumption of EHTC by EHTC users only



N = 22

Figure 17 – Daily consumption of EHTC by correspondent Dual-Users users only